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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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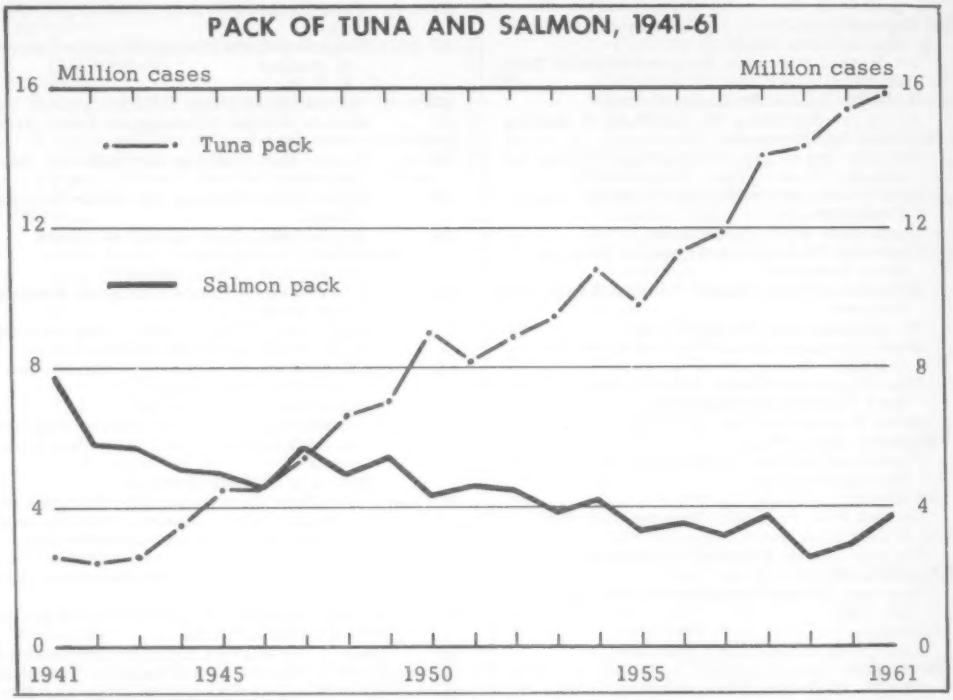
CANNED FISHERY PRODUCTS - 1961

C. F. S. No. 2862, Canned Fishery Products - 1961 (An Annual Summary), shows that the pack of canned fishery products in the United States, American Samoa, and Puerto Rico during 1961 amounted to 33 million standard cases (1 billion pounds), valued at $424 million to the packers. Compared with 1960, this was a 4-percent decrease in production but an increase of 9 percent in value.



The 1961 pack for human consumption was 48 million pounds and $41 million higher than in 1960. The gain in both quantity and value was due largely to record packs of tuna and crab meat, and to increased production of canned salmon, mackerel, and oysters. The value of two products--canned salmon and tuna--accounted for 72 percent of the total revenue received by packers of canned fishery products.

The packs of Maine and Pacific sardines, shrimp, and animal food were less than in the previous year.

Copies of C. F. S. No. 2862 are available free from the Office of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

COMMERCIAL FISHERIES REVIEW

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A METHOD OF PREDICTING FLUCTUATIONS IN THE SEA SCALLOP POPULATIONS OF MAINE

By Robert L. Dow*

DISTRIBUTION OF THE RESOURCE

The sea scallop (Placopecten magellanicus) resource of the State of Maine consists of relatively distinct populations occupying the bottom of estuaries and embayments from the Piscataqua River, separating Maine and New Hampshire, eastward to the St. Croix River which forms the international boundary with the Province of New Brunswick. Vertical distribution ranges from mean low water in some areas to depths of several hundred feet in others.

Concentrations of commercial importance are limited to the area from Penobscot Bay eastward. The most extensive populations are those of Penobscot Bay to Mt. Desert Island. In recent years landings from that area have ranged from 40 to 90 percent of the total inshore catch. Sporadic and generally non-commercial dragging has been carried on in Casco Bay, Sheepscot Bay, and the lower Damariscotta River.

Fig. 1 - A Penobscot Bay scallop being attacked by two starfish.

THE FISHERY

The fishery appears to have had its beginning about 1880 but records of landings are extant only since 1887 and then with several gaps, principally in the 1890's and between the end of World War I and the 1930's. Consecutive annual landings data are limited to the period since 1938.

The open season from November 1 through the following March 31 has been inspired by two considerations: (1) the low-water temperatures of the winter make the scallops less active and, therefore, less able to escape the small inefficient drags used in the fishery, and (2) it provides off-season employment for those fishermen who normally are engaged in other fishing activities during the remainder of the year. Since the catch is reported by calendar year, each year's landings include portions of two fishing seasons.

Sampling of the catch from 1949 to 1953 and in 1957-58 indicated that toward the end of each fishing season (January-March) an increasing number of scallops that have completed their sixth growing season enter the fishery. By that time the population of older and larger scallops has been so reduced by fishing that fishermen depend upon the new crop for a con-

*Research Directory, Maine Department of Sea and Shore Fisheries, Augusta, Maine.

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tinuing source of supply. This year-class is fished twice during the calendar year. The January-March catch represents some 12 to 15 percent of the landings for the year. Following the seventh growing season the same year-class adds another 13 to 25 percent to the year's catch; the total contribution varying with the relative importance of the year-class to the available population. Landed value for the shucked meats which has ranged from 6 cents in 1887 to 61 cents in 1952, with a median of 25 cents per pound, has continuously attracted intensive commercial activity.

LANDINGS AND ABUNDANCE

The consistency with which periodic highs have alternated with lows in landings at approximately decade intervals suggests, with what is known of the fishery, that scallop abundance has likewise fluctuated in the inshore growing areas of Maine.

Table 1 - Maine Scallop Landings[1/], Selected Years 1889-1960

Year	Weight of Meats
	1,000 Lbs.
1889	295
1899	53
1910	2,027
1919	73
1933	1,073
1944	101
1950	512
1960	72

1/Shown are only landings from Maine "inshore waters." Not included are Maine landings from offshore waters or Georges Bank in those years when Maine vessels did fish those waters.

This assumption has been supported by the biological sampling of M. A. Chrysler (1920) in 1917, and of the Department of Sea and Shore Fisheries from 1949 to 1953 and in 1957-58 which forecasted the general trends landings were to take during immediately subsequent years.

SEA WATER TEMPERATURE

The only data which indicate why these fluctuations have taken place are records of sea water temperature taken at Boothbay Harbor by the U. S. Fish and Wildlife Service or its predecessor agencies since March 1905.

Since the offspring of any year's spawning--August to October--becomes of major importance to the fishery six years later, it appears from a study of temperature and production records that an association exists between sea water temperature six years earlier and highs and lows of scallop landings.

The values in table 2 suggest an optimum temperature of 46.0° F. to 46.5° F. for peak landings. Less favorable high and low temperatures yield the lowest landings.

Fig. 2 - A typical Penobscot Bay scallop drag.

Table 2 - Relationship Between Sea Water Temperatures Six Years Earlier and Highs and Lows in Maine's Scallop Landings

Sea Water Temperature		Scallop Landings (Meats Only)	
Year	°F.	Year	1,000 Lbs.
1913	47.4	1919	73
1927	46.2	1933	1,073
1938	45.1	1944	101
1944	46.5	1950	512
1954	50.2	1960	72

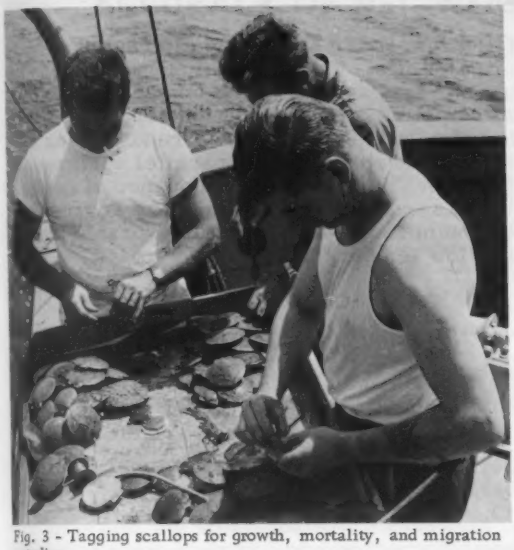

Fig. 3 - Tagging scallops for growth, mortality, and migration studies.

Fig. 4 - Bryozoon attached to adult scallop shell. Juvenile scallops in turn attached to Bryozoon.

Scallop landings for consecutive years are available only since 1938. The 24 years since 1938 were grouped by the amount of landings. Monthly mean sea water temperatures six years before were averaged for the corresponding years of landings. It was observed that years of low landings were preceded by extremely high or extremely low mean sea water temperatures. Therefore low landings were grouped according to the mean temperature six years previously.

Table 3 - Mean of Monthly Sea Water Temperatures (°F.) at Boothbay Harbor and Mean Annual Scallop Landings Six Years Later

Months												Annual Mean	Mean Scallop Landings (Meats) 6 Yrs. Later	Number of Years
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			
(°F.)													1,000 Lbs.	
33	31	33	37	46	53	59	60	56	49	42	37	45	120	4
35	34	35	40	48	55	60	61	57	50	45	38	46	500	8
37	35	37	42	48	56	62	63	59	53	48	43	49	250	8
41	40	41	45	51	57	62	62	60	55	50	45	51	105	4

The data summarized in table 3 suggest that seasonal temperatures are more closely related to subsequent yield than are annual means. October-November temperatures appear to be representative of the critical August-December spawning and post-spawning period. March-April temperatures representative of the winter-spring period appear to be equally important to the association between temperature and relative scallop abundance. This association is shown in table 4.

Table 4 - Seasonal Associations Between Temperature and Landings in Maine

Temperature Years	Mean of March-April and October-November Sea Water Temperature in °F. at Boothbay Harbor	Sea Scallop Landings (Meats Only)		
		Six Years Later	Range of Landings	Scallop Landings Years
		1,000 Lbs.		
1938, 1939	39.9	103	101-105	1944, 1945
1936, 1940, 1948	41.4	137	131-144	1942, 1946, 1954
1934, 1942	41.6	455	454-456	1940, 1948
1941, 1943, 1944	42.6	509	507-512	1947, 1949, 1950
1932	43.3	793	-	1938
1933, 1945	43.4	387	378-395	1939, 1951
1935, 1946, 1950	44.4	319	314-327	1941, 1952, 1956
1937, 1951	45.8	236	219-243	1943, 1957
1947, 1949	46.2	231		1953, 1955
1952, 1953, 1955	47.4	123	108-138	1958, 1959, 1961
1954	48.0	72	-	1960

SUMMARY

During the past 80 years the inshore sea scallop fishery in Maine has alternated at about decade intervals between extremes of high and low landings. The financial attractiveness of the resource during the winter when other species are less available, the comparatively restricted area occupied by scallops, and biological sampling of the population support the assumption that yield is an acceptably reliable index of relative abundance. Trends of sea water temperature closely parallel declines and increases in the relative abundance of sea scallops as indicated by landings and suggest an optimum range as well as unfavorable high and low temperatures.

Fig. 5 - Juvenile scallops attached by byssus to adult scallop. Smaller juvenile (4.5 mm.) is smallest found so attached. Juveniles slightly smaller than this were found attached only to Bryozoa or hydroids. Larger juvenile (9.6 mm.) is approximately largest found attached to scallop shell.

CONCLUSIONS

1. Sea water temperature is directly related to sea scallop abundance in Maine waters.

2. Optimum spring-fall sea water temperature (March-April and October-November) ranges from approximately 41.5° F. to 43.5° F.

Table 5 - Predicted Probable Annual Yield of the Maine Inshore Sea Scallop Fishery, 1962-1967

March-April and October-November Temperature		Predicted Scallop Landings (Meats Only)	
Year	Temp. °F.	Year	Quantity 1,000 Lbs.
1956	45.6	1962	240
1957	45.3	1963	270
1958	44.2	1964	350
1959	43.7	1965	370
1960	43.9	1966	350
1961	43.8	1967	360

3. If the long-range sea water temperature trend recorded since 1905 continues, it may be anticipated that average annual long-term sea scallop landings from Maine waters will continue to decline. It may be further anticipated that annual scallop landings will average approximately 100,000 pounds by 1980.

4. On the basis of 1956-1961 sea water temperature at Boothbay Harbor, predictions with respect to the probable yield of the Maine inshore sea scallop fishery are shown for the period 1962-1967 in table 5.

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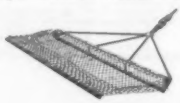

ACCURACY OF NET-WEIGHT DETERMINATIONS FOR FROZEN GLAZED HALIBUT STEAKS

By Max Patashnik*

ABSTRACT

A check was made on the accuracy of the net-weight determination for frozen glazed halibut steaks as ascertained by the method given in the current U. S. Standards for Grades of Frozen Halibut Steaks; and the possibility of simplifying the method was investigated.

INTRODUCTION

Accurate methods of evaluating quality are essential in developing and applying U. S. Standards for grades of fishery products. Periodically, official methods used in these standards are retested for accuracy and possible improvement. Inquiries into the accuracy of the method for determining net weight of frozen glazed halibut steaks were recently received at the Seattle Technological Laboratory. This method (based on the deglazing of frozen steaks according to the procedure given in the current U. S. Standards for Grades of Frozen Halibut Steaks, March 1959) was accordingly reevaluated.

In preparing frozen halibut steaks, the processor usually cuts them from frozen, dressed, glazed whole halibut and glazes the individual steaks with ice by dipping them briefly in cold water. The glaze, which serves as a protection against dehydration during subsequent storage and distribution, consists of a surface covering of ice that varies in thickness and may or may not have chemical additives incorporated in it. In setting the fill weight of the package (net weight plus glaze weight), the processor makes an allowance for the weight of the glaze (preexisting skin glaze plus added surface glaze) in order to conform to the declaration of net weight on the label. The inspector, in applying the Federal grade standard, must check the net weight in order to determine compliance.

The objectives of the present study therefore were (1) to check the accuracy of the net-weight determination for frozen glazed halibut steaks, using the official percentage-glaze method, and (2) to consider the possibility of simplifying the method.

CHECK ON ACCURACY

DESCRIPTION OF OFFICIAL METHOD: The method, as published in the U. S. Standards for Grades of Frozen Halibut Steaks, consists essentially of the following steps:

(1) Weigh the steaks with the glaze intact, which gives C, the gross weight.

(2) Thaw the glaze from the surfaces of the steak with flowing tap water.

(3) Wipe off the excess water from the surface with a single paper towel.

(4) Weigh the deglazed steaks, which gives D, the net weight.

(5) Calculate the percentage glaze as $\frac{C-D}{D} \times 100$.

EXPERIMENTAL: To test the accuracy of the method, we prepared glaze-free frozen halibut steaks of known weight and glazed them. The glaze was then thawed off and the steaks were reweighed. The difference in weight was considered to be the error in the method.

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Details of the procedure were as follows: Unglazed frozen dressed halibut were cut by bandsaw into steaks of varying size, scraped clean of sawdust, and weighed immediately, which gave the true net weight, T. The frozen steaks were then ice-glazed by being dipped into cold fresh water. From 2- to 12-percent glaze by weight of the individual steak was added, and the steaks were stored at 0° F. until tested. In a series of tests at intervals of time the glazed steaks were deglazed and weighed (actual net weight, D) according to the official method. This work was done by four analysts, using steaks that varied in size and in percentage of glaze.

The percentage error in the determination of true net weight was calculated as follows:

$$\frac{\text{(actual net weight - true net weight) x 100}}{\text{true net weight}} = \frac{(D - T) \times 100}{T}$$

RESULTS AND DISCUSSION: The data are shown in tables 1 and 2. Table 1 lists the average percentage error for series A, B, and C. Table 2 lists the range of the maximum and minimum individual values for experimental series A, which gives an indication of the variability of individual values.

Table 1 - Average Percentage Error in the Determination of True Net Weight

Series	Experiment	Total Steaks	Range in Steak Weights	Range in Amount of Glaze	Average Error in True Net Weight as Found by Analyst:			
					A	B	C	D
	No.	No.	Grams	Percent	Percent	Percent	Percent	Percent
A	1	50	177-286	2.1-12.5	-0.2	-0.1	-0.1	-
	2	50	175-283	2.0- 5.8	+0.4	+0.2	+0.3	-
	3	50	91-343	4.5- 7.8	0.0	-0.2	-	-
	4	1/38	86-225	4.1- 7.5	-0.2	+0.1	-	-
B	5(a)	9	102-168		-	-	-	+0.9
	(b)	16	82-157		-	-	-0.6	-
	6(a)	32	160-371		-	-	-	+0.7
	(b)	19	200-339	2.9- 9.9	-	-	0.0	-
	7	29	108-226		-	-	+0.2	-
	8	52	107-228		-	-	-	+0.1
	9	50	97-239		-	-	+0.2	-
C	10(a)	9	2/125-284	glaze free	-	-	+0.2	-
	(b)	9	3/125-284	"	-	-	-0.3	-
	(c)	9	4/125-284	"	-	-	-0.4	-

1/In experiment 4, analyst A tested 6 steaks; analyst B, 32 steaks; the steaks were equally divided in experiments 1, 2, and 3.
2/These glaze-free samples were stored for 4 months at 0° F. in polyethylene bags till slightly dehydrated. They were deglazed in accordance with the standard procedure.
3/Each steak from experiment 10(a) was given seven successive 10-second thawing exposures to 50° -F. running water at 1-minute intervals until they were almost completely thawed. They were then weighed after removal of excess surface water.
4/Each steak from experiment 10(b) was frozen overnight, and the procedure for 10(b) was repeated.

Series A: In this first series of tests on 188 steaks by three analysts, the average values ranged from +0.4 to -0.2 percent of true net weight. All the individual values (table 2) were within the range of +1.3 to -1.3 percent of the true net weight, and 95 percent of the individual values were within the range of +1.0 to -0.9 percent of the true net weight.

Table 2 - Range of Individual Values for Percentage Error in the Determination of True Net Weight

Series	Experiment	Total Steaks	Range of Error in True Net Weight		Remarks
			All Individual Values Are Within:	95% of Individual Values Are Within:	
	No.	No.	Percent	Percent	
A	1	50	-1.3 to +0.7	-0.9 to +0.5	Data obtained by 3 experienced analysts.
	2	50	-0.7 to +1.3	-0.4 to +1.0	
	3	50	-0.8 to +0.5	-0.6 to +0.5	Data obtained by 2 experienced analysts.
	4	38	-1.0 to +0.4	-0.6 to +0.5	

Series B: In this second series of tests (2 years later) on 207 steaks by two analysts without trial practice, the average values ranged from -0.6 to +0.9 percent from true net weight. With further practice, the analysts improved their techniques, and the average differences from true net weight were 0.2 percent or less for the last four experiments in this series.

Series C: In the third series of tests (4 months after series B) on a lot of nine unglazed steaks stored for 4 months at 0° F. to observe the effect of slight dehydration (simulated short retail storage), an experienced analyst obtained an average value of +0.2 percent of true net weight. To observe the effect of excessive thawing, we subjected these same steaks to seven successive 10-second exposures to running water (50° F.) at 1-minute intervals until they were almost completely thawed. The average error in true net weight was -0.3 percent. The same steaks were frozen overnight and again given seven successive 10-second exposures to running water. The average error in true net weight was now found to be -0.4 percent. Thus, slight dehydration of the sample or overthawing of the sample do not introduce serious errors in the method under test.

POSSIBILITY OF SIMPLIFYING THE METHOD

Various steps in the procedure were examined for possible improvement or simplification.

FLOW RATE AND TEMPERATURE OF DEGLAZING WATER: In the removal of the glaze from halibut steaks, the official method specifies a rate of flow of 3 quarts per minute and the use of tap water at 50° to 60° F.

Variations in temperature and in rate of flow of the water had no significant effects, indicating that strict adherence to this part of the procedure is not necessary.

DEGREE OF DEGLAZING AND WIPING OFF OF EXCESS WATER: The official method specifies that deglazing be continued until "all glaze is removed from cut flesh surface, as evidenced by absence of slick feel to finger," and that the analyst should "rapidly remove excess water with single paper towel."

Slight to moderate overthawing of the steak surface during deglazing had no significant effect, provided that the excess water was gently wiped off with a single paper towel. It should be remembered in carrying out this step that the surface of the thawed steak is like a wet sponge. Vigorously blotting each steak with a new dry towel will remove fluid from the meat, thereby giving a smaller actual net weight.

The following two alternative modifications in the method of removing excess water from the March 1959 published method were tested:

(a) Gently wipe off the excess water with a single paper towel that is saturated with moisture. (Use of the moisture-saturated towel avoids the possible blotting action of a dry towel.)

(b) Shake off the excess water. In this step, hold the steak lightly and then vigorously shake it 6 times through a 1-foot arc. (In using this modification, slightly overthaw the steak surface rather than underthaw it.)

The two alternative methods gave equivalent results, though the shaking method was slightly faster and simpler. The difference, however, was not sufficient to justify a recommendation of one over the other.

CONCLUSIONS

(1) In a test of the official method for determining the average net weight of frozen glazed halibut steaks, results were within ±1.0 percent of the true net weight.

(2) Variation in temperature and rate of flow of thawing water for removing glaze in the official method and moderate overthawing of the steak surface had no significant effects, indicating that strict adherence to this part of the procedure is not necessary.

Careful removal of excess water from the surface of the deglazed steak was the key operation. To obtain best results, the analyst should gently remove surface water, either by

use of a moisture-saturated paper towel, avoiding vigorous blotting with a dry paper towel, or by holding the partly thawed steak lightly and shaking it six times through a 1-foot arc.

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VARY YOUR MENUS BY SERVING DEVILED CLAMS

Many traditions in the United States have grown up around the serving and eating of clams. Annual clam eating contests are held in various coastal regions of the country. The connotations of the term "Clambake" have extended the use of that word far beyond its original meaning. Few controversies, in cooking circles at least, have more participants than that which centers on the proper way to prepare clams.

It is not only the fine distinctive flavor that recommends clams as a food; they are also an excellent source of the "protective" nutrients, including proteins, minerals, and vitamins.

Clams may be purchased in three forms: in the shell, shucked, and canned. On the Atlantic coast, the marketed species are the hard, soft, and surf clams. On the Pacific coast, the most common market species are the butter, littleneck, razor, and pismo clams.

Although clams are served most often in chowders, steamed, raw on the half shell, or at clambakes, there are many other good ways to serve them. One of these which the home economists of the Bureau of Commercial Fisheries, United States Department of the Interior, recommend serving is "Deviled Clams".

DEVILED CLAMS

1 pint clams or 2 cans (7 ounces each) clams
½ cup chopped celery
2 tablespoons chopped onion
1 clove garlic, finely chopped
¼ cup butter or other fat, melted
1 tablespoon flour
¾ teaspoon salt
¼ teaspoon pepper
¼ teaspoon thyme
3 drops tabasco
1 tablespoon chili sauce
1 egg, beaten
½ cup cracker meal
2 tablespoons chopped parsley
2 tablespoons butter or other fat, melted
½ cup dry bread crumbs

Drain clams. Chop. Cook celery, onion, and garlic in butter until tender. Blend in flour and seasonings. Add clams and cook until thick, stirring constantly. Stir a little of the hot sauce into egg, add to remaining sauce, stirring constantly. Add meal and parsley. Place in 6 well-greased individual shells or casseroles. Combine butter and crumbs. Sprinkle over top of deviled clams. Bake in a hot oven, 400° F., for 10 minutes or until brown. Serves 6.

TRENDS AND DEVELOPMENTS

California

SPINY LOBSTER REGULATIONS AND SHRIMP TRAWLING QUOTAS CHANGED: New rules adopted for the California spiny lobster fishery by the California Fish and Game Commission prohibit the pulling of traps at night and require uniform-size permit numbers on trap buoys.

Shrimp trawling quotas were changed in two areas by the Commission. The quota in the area off California between the Oregon border and False Cape, Calif., was raised from 1,250,000 to 1,500,000 pounds. The quota in the area between False Cape and Point Arena, Calif., was lowered from 850,000 to 250,000 pounds.

The Commission made the changes at its August 24, 1962, meeting in San Francisco.

* * * * *

GROWTH STUDIES AND ABUNDANCE OF MARKET CRABS INVESTIGATED: M/V "Nautilus" Cruise 62-N-2a-Crab (January 15-19, 1962), 2b (February 12-16), 2c (March 12-16), 2d (April 9-13), 2e (May 7-11), 2f (June 18-22): A series of cruises by the California Department of Fish and Game research vessel Nautilus in the coastal waters off central California from Bodega Bay to San Francisco. The two objectives of these cruises were: (1) to collect dungeness (market) crabs (Cancer magister) for growth studies, using traps and a 10-foot beam trawl, and (2) to determine time of occurrence and relative abundance of crabs in areas of operations.

Collections were made at selected stations from Bodega Head to San Francisco using a 10-foot beam trawl with a 1-inch mesh net, commercial-type crab traps, and 1-inch mesh crab traps. A ½-inch liner was added to the cod end of the trawl net in May, in order to collect crabs in the first post-larval stages. The crab traps were baited with squid and rockfish and fished overnight. Beam trawling was done at each station. Each drag lasted about 20 minutes and covered three-quarters of a mile. Exploratory beam trawling was accomplished at stations where traps were not set (fig. 1).

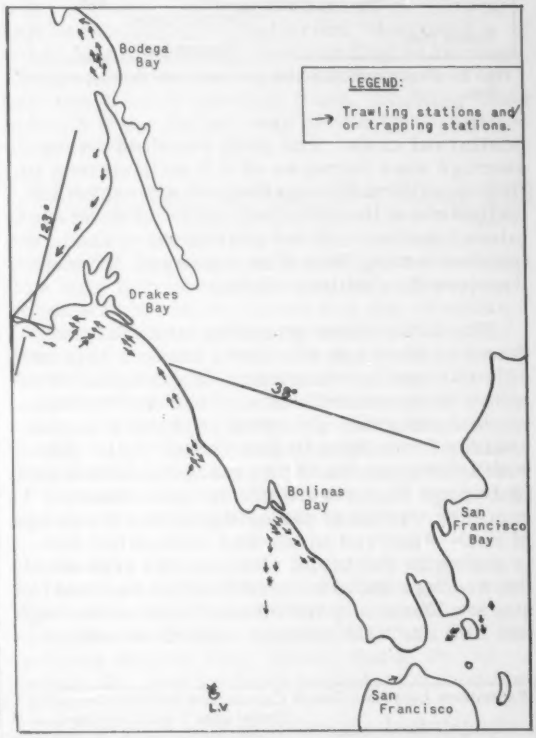

Fig. 1 - Cruises 62-N-2a through f by the research vessel Nautilus, showing location of trawl and trap stations.

It was possible to estimate age from the samples taken. At metamorphosis, crabs are about 4½ to 5 months old, calculated from their January hatching. Collections of megalops in May showed the last larval stages averaged 3.7 millimeters. Those megalops were held in an aquarium for 24 to 48 hours where they molted into the first

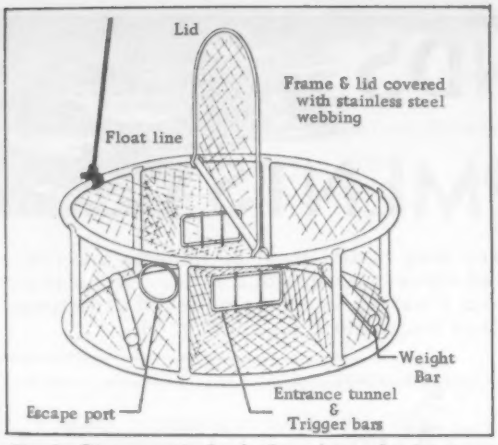

Fig. 2 - Diagrammatic sketch of a crab trap showing escape port.

postlarval crab. The molt resulted in an average size increase of 3.3 millimeters to first postlarval instars which averaged 7.0 millimeters in width (exclusive of anterolateral spines). First postlarval crabs trawled during May also averaged 7.0 millimeters in shoulder width.

The table below provides continuity of data and shows preliminary instar and growth calculations for dungeness crabs as determined from collections and measurements made during this series of cruises and the cruises from June to December 1961. The width-frequencies of the market crabs taken in Bodega Bay were determined. Mean shoulder widths of the crabs within the range of each observed mode was calculated and is shown in the table. Each mean represents the average shoulder width of the various instars. The crabs have been followed through the 10th and 11th instars. Dates of occurrences include the month in which the crabs were first observed and the month in which they were last observed.

Mating activity of male crabs was determined by examining chelipeds for abrasions and other marks incurred while the male was clutching the female. The smallest male examined was 65 millimeters but none less than 132 millimeters had mating marks. Males over 180 millimeters in shoulder width showed fewer abrasions or marks, and were presumed to have been less active.

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MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62-N-7a-Salmon (July 12-13, 1962) and 62-N-7b (July 23-27, 1962): The capture of marked salmon fingerlings on their seaward migration was the objective of both trips by the California Department of Fish and Game research vessel Nautilus. The vessel operated in the Carquinez Strait, using a nylon midwater trawl with a 25-foot square opening. Trawling was conducted between 8 a.m. and 3 p.m., with each tow lasting 20 minutes. Tows were alternated between upstream and downstream, and between the north shore center, and south shore of the channel.

A total of 72 tows completed in the Strait during the cruises yielded a catch of 56 king

King salmon
(Oncorhynchus tshawytscha)

Preliminary Instar and Growth Calculations for Male Dungeness Crabs as Determined by Means of Modes from a Width Frequency Graph
(Instar sizes 1 and 2 are assumed to be the same for both groups observed.)

Instar	Range in mm. 1/	Mean	Absolute Increase	Percentage Increase	Range in mm. 1/	Mean	Absolute Increase	Percentage Increase	Date of Occurrence
1	7-7	7	0	0	7-7	7	0	0	May-June
2	9-14	11.5	4.5	64.0	9-14	11.5	4.5	64.3	May-Aug.
3	14-19	16.0	4.5	39.1	14-19	15.9	4.4	38.3	June-Oct.
4	18-26	21.1	5.1	31.9	19-24	21.9	6.0	37.7	June-Dec.
5	23-33	27.8	6.7	31.8	26-33	29.2	7.3	33.3	Aug.-Feb.
6	30-41	35.6	7.8	28.1	33-44	39.0	9.8	33.6	Nov.-May
7	39-55	47.1	11.5	32.3	41-56	47.5	8.5	21.8	Nov.-May
8	54-73	63.4	16.3	34.6	56-76	65.4	17.9	37.7	Nov.-June
9	74-92	83.3	19.9	31.4	74-92	83.3	17.9	27.4	Jan.-
10	-	-	-	-	92-106	96.6	13.6	16.3	Feb.-
11	-	-	-	-	108-129	118.3	21.7	22.5	June

1/mm. = millimeters.

salmon (Oncorhynchus tshawytscha). None of these fish were marked.

Other Species Caught by the Nautilus on Cruise 62-N-7a and 62-N-7b

Species	Number
Northern anchovy (Engraulis mordax)	103,000(est.)
Jacksmelt (Atherinopsis californiensis)	16,000(est.)
Sacramento smelt (Spirinchus thaleichthys)	800(est.)
Pacific herring (Clupea pallasi)	500(est.)
Striped bass (Roccus saxatilis)	417
King salmon (Oncorhynchus tshawytscha)	56
Northern midshipman (Porichthys notatus)	27
Surfsmelt (Hypomesus pretiosus)	3
American shad (Alosa sapidissima)	1
Three-spined stickleback (Gasterosteus aculeatus)	1

The morning of July 27 was spent in collecting bottom samples in the lower Napa River, in the vicinity of the atomic submarine refueling pens. The samples were to be tested for the presence, or lack, of atomic radiation by the Public Health Department.

Note: See Commercial Fisheries Review, September 1962 p. 15.

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PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 62-6-Pelagic Fish (June 13-14, 1962): To determine the distribution and abundance of pelagic fish schools, the area from the United States-Mexican Border to San Luis Obispo Bay was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

No flights were made on June 11 and 12 because of low overcast. On June 13, the area from the United States-Mexican Border to Pt. Conception, Calif., was surveyed. Thirty-four anchovy schools were counted from the Tia Juana River to about 5 miles north of the river. The area around Pt. Loma could not be surveyed because of military air traffic. Between Dana Pt. and the Santa Ana River, 192 schools of anchovies were counted. Some of the schools were "breezing" and were visible for several miles. From the extent of "breezing" schools visible at sea beyond the limit of the plane's safety factor, it was estimated there were between 500 and 600 schools in the area. Between Topanga Canyon and Pt. Dume, 168 anchovy schools were counted and a few dim spots were observed around Santa Barbara.

The coastline from Long Beach Harbor to San Luis Obispo Bay was surveyed on June 14 but low clouds prohibited operating farther north. In addition to the concentration between Topanga Canyon and Pt. Dume observed on June 13, anchovy schools were sighted in the central inshore Santa Monica Bay area, and also in the Port Hueneme-Santa Barbara and Los Angeles Harbor areas. There were 44 anchovy schools off Santa Monica and 41 between Port Hueneme and Goleta. Visibility was poor around Santa Barbara, and the few schools seen there were very dim. More schools probably would have been visible if weather conditions had been better.

For the first time in many months anchovy schools were seen from the air in the Los Angeles-Long Beach Harbor, and 61 schools were counted. Although no anchovy schools had been visible in the Harbor or around Santa Monica during previous flights during 1962, anchovies were present because live-bait boats were catching them. Sighting those schools from the air was probably because of clearer water.

Airplane Spotting Flight 62-7-Pelagic Fish (July 18-20, 1962): On the first day's flight, the coast from the United States-Mexican Border to Los Angeles Harbor was surveyed. The only fish observed were 54 anchovy schools between Pt. Loma and the Mexican Border. The large concentration of anchovies that was seen between the Santa Ana River and Dana Pt. on the June flight, apparently had moved out. This resulted in the bait boats that normally work the area having to go to Los Angeles Harbor for bait. The bait haulers blamed the disappearance of the anchovies on the clearing of the water, and the presence of bonito inshore.

On July 19, the area from Los Angeles Harbor to a few miles above Goleta Pt. was surveyed. Fourteen anchovy schools were spotted outside Los Angeles Harbor, and 21 in Santa Monica Bay. From Gorda Pt. to Goleta Pt., 400 anchovy schools were counted.

An attempt was made on the last day of the flight to survey the area from Monterey Bay to San Luis Obispo Bay. But because of a solid cloud bank along most of the coast, only San Luis Obispo Bay, Estero Bay, San Simeon Bay, and a small part of Monterey Bay could be covered. The fish count in those areas was 15 anchovy schools, which were sighted off the Cayucos pier in Estero Bay.

Note: See Commercial Fisheries Review, August 1962 p. 15.

Cans--Shipments for Fishery Products, January-June 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-June 1962 was 4.1 percent above that used during the same period in 1961. Prior to this year, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.

A total of 1,511,133 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first six months of 1962, whereas in the same period of 1961 (when only tinplate was reported) 1,452,246 base boxes of steel were consumed. The increase was mainly due to larger packs of Maine sardines and tuna during the first six months of 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14"x20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.

Central Pacific Fisheries Investigations

SKIPJACK TUNA SUBPOPULATION IDENTIFICATION STUDIES:

The relationship between seasonal changes in the abundance of skipjack (aku) tuna and changes in the chemical and physical properties of the ocean in the vicinity of the Hawaiian Islands is being studied by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii. By studying the physical properties of the ocean, it has been possible to predict whether or not the total annual landings of skipjack for a year will exceed or fall below a figure based on the average catch for about 10 years.

In the skipjack fishery of the Hawaiian Islands, it has long been known that large fish, called "season" fish, enter the fishery in large numbers in the spring and summer only to disappear again in the fall and winter.

Skipjack tuna

It is now known that there is a relationship between the changes which occur in the early spring in the physical properties of the ocean circulation systems in the Hawaiian chain and the relative abundance of "season" skipjack found later in the spring and summer.

In order to understand more completely the biological significance of those findings, the Laboratory has been carrying out a sampling program in which two measures of the skipjack population have been obtained.

One of the two measures involves a study of chemical substances which occur on the red blood cells of nearly all red-blooded animals. These chemicals, called blood group substances (like the A and B substances of man, for example) are products of genes, the units of inheritance, which govern the basic developmental processes of all living things. Because blood group substances are produced by genes, it is possible to genetically classify populations by means of counting the relative proportions of one or more blood group substances which occur in the population. If two samples of skipjack have different frequencies of the same substance, it is certain that they were taken from two different populations. It has recently been observed that in skipjack samples obtained from Hawaiian waters, two distinctly different frequencies of the same substance in the B-system of aku blood groups occur.

The second measure of the populations studied has to do with measuring the lengths of a large number of fish. In some years, the relative numbers of fish that are two years old (judged by length) is very much greater than the number of 1-year old fish present in the previous year. This finding

implies that many 2-year old fish are entering the fishery from another population.

Both lines of evidence presented are consistent with the idea that there are two different populations of aku which enter the fishery. One population composed of fish of all sizes, both large and small, and classified by blood group studies as population I fish, are found in all seasons. Fish of the other population, or population II fish, have only been found to be large.

The question that arises is, where do the group II fish come from? So far this is not known. But it is interesting to note that a skipjack tagged near Baja California, Mexico, was caught on June 12 near Oahu, Hawaii, weighing 26 pounds when caught, just slightly larger than the mean of group II fish sampled in the summer of 1962.

The next step in the study being made is to attempt to determine the relationship between group II fish and skipjack populations to the east of Hawaii, and also to ascertain the relationship between those fish and the physical oceanography which plays such an important role in their migratory habits.

Note: See Commercial Fisheries Review, June 1962 p. 7.

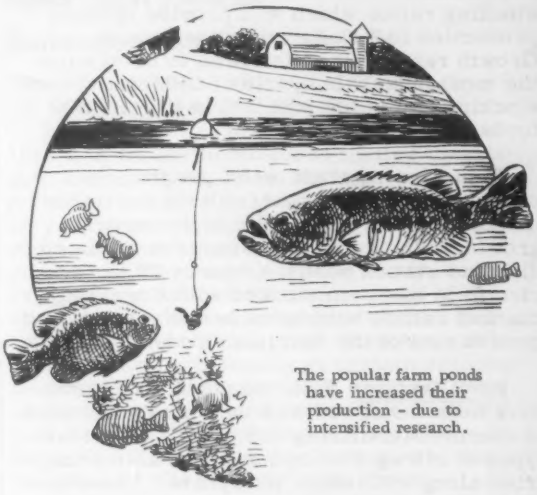
Fish Farming

Some of the highlights of the program at the Stuttgart, Arkansas, Fish Farming Experimental Station of the Bureau of Sport Fisheries and Wildlife during April-June 1962:

CONSTRUCTION OF FACILITIES: Forty-five experimental ponds (including 20 0.1-acre ponds, 20 0.25-acre ponds, and 5 1.0-acre ponds) were accepted by the Regional Engineer of the Bureau on April 27, 1962. Three well houses with pumps and the storage reservoir were accepted at the same time. All completed experimental ponds at the new station had been filled with either surface or ground water and stocked with fish by June 1962. A contract will probably be negotiated before the end of 1962 to complete 36 additional experimental ponds (including 16 0.1-acre ponds, 16 0.25-acre ponds, and 4 1.0-acre ponds) by installing water supply lines, drains, and concrete structures with valves.

Severe problems due to water quality became very prominent in early May and a contract was let on May 16, 1962, for the construction of a water-treatment plant. The plant, which will remove excess iron and manganese from the water supplied to the laboratory and service buildings, was completed in the summer of 1962.

RESEARCH: Nutrition: Sixteen 0.25-acre ponds were stocked with fingerling channel catfish and fed experimental feeds. Some of the feeds are available commercially and others were formulated at the Experimental Station.



The popular farm ponds have increased their production - due to intensified research.

Protein studies were interrupted in the spring of 1962 by water quality problems. But new studies were started July 1, 1962, using channel catfish fry kept in troughs. They were fed test rations to get comparative data on various high protein meals which are commercially available.

Fish Cultural Studies: Successful spawning of channel catfish, flathead catfish, Israeli carp, and buffalofish was accomplished with the use of 700 international units of chorionic gonadotrophins per pound of body weight. Catfish eggs of both species hatched well but considerable difficulty was experienced in getting the flathead fry to feed. The carp and buffalofish eggs failed to hatch probably because of water quality problems.

Hybridization attempts between species of catfish, buffalofish, and carp-buffalofish

crosses were unsuccessful. In addition to chorionic gonadotrophin injections of the females, delatestryl (testosterone enenthate) was administered intraperitoneally into the males to intensify the spawning drive. Some response was apparent in Israeli carp males when placed in spawning aquaria with buffalofish females.

Studies began on the possible sterilization of Israeli carp fingerlings by using diethylstilbesterol in the daily ration at levels of 1 and 2 percent.

Studies have been started to determine the best combinations of species and the proper stocking ratios which will provide optimal production in fish-farming reservoirs. Growth rates will be followed to determine the most desirable species combinations and stocking ratios for efficient use of natural foods.

Fish-rice rotation tests, programmed over a four-year period, as well as studies on the effect on yields of simultaneously growing fish and rice are under way. In addition to station ponds, a nearby 20-acre rice field has been stocked with fingerling channel catfish to determine the survival and growth rate of the fish in a flooded rice field.

Fertilization: Selected ponds (0.1 acre) have been fertilized with varying proportions of common fertilizing compounds. Various types of nitrogen compounds are also being tried along with super phosphate. Changes in the flora and fauna and in total plankton are being followed. Laboratory experiments are also in progress.

Note: See Commercial Fisheries Review, September 1962 p. 23.

Food Congress

INTERIOR DEPARTMENT EXHIBIT AT FIFTH INTERNATIONAL FOOD CONGRESS:

Helping the fishing industry bring seafood to home and institutional tables in the most efficient way possible and in conserving the wealth of fishery resources was the theme of a special exhibit by the U. S. Department of the Interior at the Fifth International Food Congress and Exhibition. The Congress, held at the New York Coliseum, New York City, September 8-16, 1962, was attended by delegates from more than 30 countries. This was the first time it was held in the United States.

The Department of the Interior's Bureau of Commercial Fisheries exhibit was located in the International Pavilion. Four panels, with special lighting effects, comprised the exhibit, and each panel depicted a different phase of the Bureau's efforts in furthering the use of fishery resources.

The title of the first panel was "The Resource," and it showed the Bureau's biological fishery research work. Four telephones connected with the panel carried taped messages for the 50,000 or more executives of food and allied industries, and the more than 250,000 consumers who were expected to visit the exposition and view the exhibits.

The panel named "Harvesting" depicted some of the efficient fishing methods that have been developed, including the air bubble curtain which is capable of catching a school of fish, plane spotting of fish from the air, bottom and midwater trawling, and electronic fishing.

The third panel illustrated newly-developed fish products made possible by technological research and advancement--irradiated fish which have a much longer shelf life than fresh fish, and fish protein concentrate (fish flour) which could be the lifeline of the future for millions of the world's undernourished and protein-deficient populations.

The services of the Bureau of Commercial Fisheries in the field of marketing, and the collection and dissemination of market news were shown in the final panel of the exhibit, including research conducted in test kitchens at the Bureau's Technological Laboratory at College Park, Md. Some of the research equipment used by the Bureau and illustrations of the various market forms of fish completed the display.

"Fishery products play such an important role in a nutritious diet today that it has been decided that this source of nutrition merits special consideration," the Food Congress said in inviting the Bureau to participate in the international event.

In acknowledging the invitation on behalf of the Department, Secretary of the Interior Stewart L. Udall said fisheries research heralds new frontiers in nutrition and health for America's citizens and its neighbors across the seas.

In his June 11 letter of acknowledgment, the Secretary wrote that the United States Department of the Interior was very much interested in the Congress, especially since it afforded a unique opportunity for an exchange of ideas on the international plane.

The Secretary mentioned that in September 1961, the United States hosted the International Conference on Fish in Nutrition, sponsored by the Food and Agriculture Organization of the United Nations. That conference was held in Washington, D. C., and was attended by scientists and industrialists from 33 nations. At that conference, it was pointed out that more than half of the peoples of the world are suffering from malnutrition. Many millions lack enough of the proper food ingredients for an adequate and balanced diet and numbers are suffering from diet associated diseases. The Secretary said it was clearly established that protein from the sea was the key to meeting these worldwide dietary associated problems. Fish protein offers the most practical way of meeting the dietary needs of the undernourished of the world. This, he said, was the message to be presented to the food industry through the Department of the Interior's exhibit.

Secretary of the Interior Udall was a member of the Committee of Honor of the Fifth International Food Congress and was represented at the meetings by officials of the Bureau of Commercial Fisheries.

Frozen Fish

NEW MECHANIZED MICROWAVE OVEN FOR THAWING FROZEN FISH:

A United States firm has designed a new microwave oven defroster with openings on both ends so that a conveyor belt can pass through the oven. The conveyor belt can feed frozen fish into the oven and remove the fish after they are thawed. Previous microwave ovens had to be completely enclosed to trap the microwave energy. An innovation in design enables the new oven to trap the microwave energy without being sealed.

The microwave energy compartment in the new oven is three feet long. As frozen fish pass through the compartment; they are penetrated by ultra-high-frequency deep heat and thawed in 60 seconds.

A Canadian biochemist researcher is still testing the effects of microwave defrosting on fish. The researcher plans to refreeze radar-defrosted fish, store the fish for one year, and then defrost them again for flavor and food-value analyses. Also, another phase of the study, in progress for one year, has been the evaluation of the most efficient method of freezing fish at sea. (South African Shipping News and Fishing Industry Review, May 1962.)

Great Lakes Fisheries

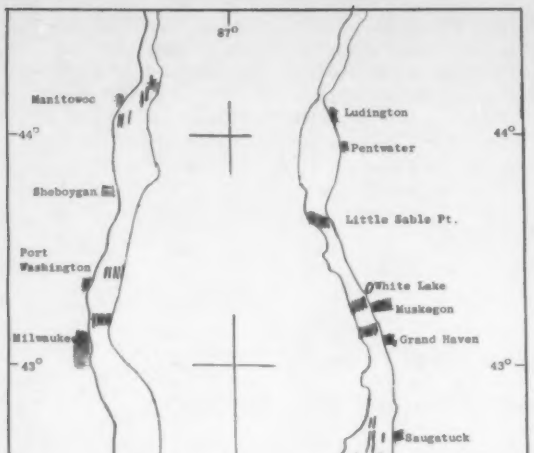
Exploration and Gear Research

TRAWL FISHING INVESTIGATION OF SOUTHERN LAKE MICHIGAN:

M/V "Kaho" Cruise 3 (June 12-August 29, 1962): A three-month trawl fishing investigation of southern Lake Michigan was completed on August 29, 1962, by the exploratory fishing vessel Kaho of the U. S. Bureau of Commercial Fisheries. Principal objectives of the cruise were to study the bathymetric or distribution in depth of various fish stocks and determine their availability to commercial types of otter-trawl fishing gear periodically at certain selected geographical locations. The over-all area of operations extended around the southern perimeter of Lake Michigan from Little Sable Point, Mich., on the east shore, to Manitowoc, Wis., on the west shore.

A total of 142 30-minute drags were made at depths ranging from 9.5 to 40.5 fathoms at sampling stations established during previous cruises (see chart). An additional 40 drags (ranging from 15 minutes to 2 hours duration) were made to compare effectiveness of fishing gear modifications and day-night fishing.

Commercially-significant catches were taken during each of the 3 phases; however, the final phase in August was considerably more productive than either the June or July phases. Catches were all poor (less than 400 pounds per hour) on the east shore during the June phase. On the west shore, however, catches of over 600 and up to 830 pounds per hour were taken at all but 1 of the 4 sampling stations. During the July phase, catches of 510 to 640 pounds per hour were taken at 3 of the 5 east shore sampling stations, and 648



Lake Michigan explorations by M/V Kaho on Cruise 3 (June 12-August 29, 1962.

to 1,242 pounds per hour at 2 of the 4 west shore sampling stations. All 9 stations yielded 636 or more pounds per hour during the August phase.

Catches of over 1,000 pounds per hour were taken as follows: phase I--none; phase II--at 15 and 20 fathoms off Waukegan; phase III--at 10, 15, and 20 fathoms off Little Sable Point, at 15 fathoms off Grand Haven, at 35 fathoms off Milwaukee, and at 20 and 25 fathoms off Port Washington. The best catch (1,200 pounds) was taken in a 30-minute drag at 20 fathoms off Port Washington.

Depths yielding best catches varied within each sampling station from period to period, but did not vary uniformly from area to area during any particular period.

The percentage breakdown of principal species making up the total actual catch of 35,949 pounds of fish taken during the cruise was as follows: chub (Coregonus hoyi)--82.6 percent, large chub--8.3, alewife--7.6, yellow perch--1.2, and smelt--0.2 percent. All other species accounted for less than 0.1 percent of the total catch. Alewife appeared in a total of 69 catches, and from 50 to 520 pounds were taken in 15 drags at 10 to 25 fathoms. Yellow perch appeared in 48 catches, and from 15 to 145 pounds were taken in 5 drags at 10 and 15 fathoms in phases II and III. Smelt appeared in 26 catches; less than 15 pounds per drag were taken in 25 drags, and one catch of 50 pounds was taken at 15 fathoms off Waukegan during phase II. Only 4 individual whitefish were taken in 4 separate drags. Herring appeared only in amounts of less than 1 pound and in only 5 drags. Other species noted in the catches included: lake trout (two only), cottids (sculpins), sea lamprey, suckers, and trout-perch.

A special test designed to compare day and night trawling effectiveness was conducted off Saugatuck in June and August and off St. Joseph in July. Each of the tests were confined to a limited area and depth zone. In June, 6 daylight drags averaged 215 pounds per hour and 5 night drags averaged only 86 pounds per hour. In July, 3 daylight drags averaged 167 pounds per hour and the 3 night drags, 149 pounds per hour. In August, the catches averaged 618 pounds per hour for 2 daylight drags as compared to 75 pounds per hour for 2 night drags.

During July 10-12, operations were conducted in cooperation with the U. S. Department of Agriculture to obtain and process C. hoyi chubs for Agriculture's mink-feeding experiments at the Cornell University Fur Animal Research Farm. A refrigerated water system was used to hold about 2 tons of the fish in a preliminary study to determine the practicality and problems involved in this type of storage aboard Great Lakes' commercial fishing vessels.

Surface temperatures ranged from 47° to 70° F. during phase I; 57° to 72° F. during phase II; and 48° to 75° F. during phase III.

A standard 52-foot (headrope) Gulf of Mexico semiballoon-type trawl net was fished on the routine sampling stations. A new 65-foot nylon modified-West Coast box-type trawl was compared with the standard net with favorable results, but the data obtained were insufficient to make exacting determinations.

Slight to moderate gear damage was incurred by bottom obstacles during 7 of the 182 drags.

Underwater television tests were conducted in cooperation with a private firm during the final 2 days of phases I and III. Gear configuration and fish behavior within the net were studied with good results.

The Kaho was expected to depart Saugatuck, Mich., September 19, 1962, on cruise 4 en route to Lake Erie for 29 days of exploratory trawl fishing operations. All United States waters of Lake Erie were to be explored. The primary objective of the cruise was to extend seasonal knowledge regarding the location, bathymetric or distribution in depth, relative abundance, and availability of various species of fish to standard otter trawl fishing gear. Echo-sounding equipment was to be used to survey bottom conditions and record fish concentrations. Bathythermograph casts and bottom samples were to be taken at each fishing station. A 52-foot (headrope) Gulf of Mexico-type otter trawl was to be used at standard stations to assess the commercial trawling potential. A newly-designed 65-foot western-style otter trawl was to be tested to determine its effectiveness on Lake Erie fish.

Note: See Commercial Fisheries Review, July 1962 p. 20.

Great Lakes Fishery Investigations

DISTRIBUTION OF LAKE TROUT IN WESTERN LAKE SUPERIOR STUDIED: M/V "Siscowet" Cruise 5 (August 14-19, 1962): Studies to obtain information on the abundance and distribution of native and hatchery-reared lake trout in western Lake Superior waters were conducted by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Work was done at Shelter Bay (near Laughing Fish Point), Keweenaw Bay, and Traverse Bay, Mich.

Semiballoon trawls were fished at depths of 16 to 42 fathoms and standard gangs of experimental gill nets (1- to 5-inch mesh by ½-inch intervals) were fished at 17 to 77 fathoms.

Five 10-minute trawl tows in Shelter Bay yielded only 6 lake trout, all of which were hatchery-reared fish planted at Munising (4 were from the 1962 plant, and 1 each from the 1961 and 1960 plant). In Keweenaw Bay, 13 tows yielded 26 small lake trout, of which 18 had been stocked as yearlings in Keweenaw Bay in 1961 and 8 in 1960 (2 planted from shore and 6 by boat). The average length of the recaptured lake trout from the 1961 plant (8.2 inches) was 3.2 inches longer than at the time of planting. Four tows in Traverse Bay yielded 12 lake trout, all of which were fin-clipped. Nine of those fish had been planted in Traverse Bay in 1962, 2 in Keweenaw Bay in 1961, and 1 in Keweenaw Bay in 1960. Other species caught in trawls at the different stations included smelt, pygmy whitefish, sculpins, ninespine sticklebacks, and small coregonines (family of whitefishes).

Experimental gill nets were set in Keweenaw Bay northwest of Point Abbaye and northeast of Pequaming (see table).

Number of Species Caught by M/V Siscowet from One-Night Sets

Species	Location and Depth (Fathoms)		
	Point Abbaye		Pequaming
	17-24	20-33	63-77
	(Number)		
Chub:			
C. hoyi	31	68	170
C. kiyi	18	7	34
C. zenithicus	7	39	50
Lake herring	15	8	1
Lake trout	13	24	-
Smelt	69	55	-

Of the 37 lake trout caught, 25 fish or 68 percent were fin-clipped. The fish ranged in length from 9.1 to 20.0 inches.

The chub were in various stages of sexual development. Of the Coregonus zenithicus, about half were nearly ripe and the other half were spent. Most of the C. kiyi had well-developed gonads (sexual glands), although 2 were spent, and 2 were ripe. All C. hoyi had well-developed gonads.

Surface water temperatures ranged from 56.3° F. in Traverse Bay to 60.8° F. in Keweenaw Bay.

Scheduled cruises 3 and 4 were cancelled to allow time for extensive alteration of the Siscowet at a Wisconsin shipyard. The addition of five feet to the length of the vessel, and reconstruction of the stern, added much-needed work space to the back deck. The improvements greatly facilitate the operation of trawls, gill nets, and other experimental gear.

Note: See Commercial Fisheries Review, September 1962 p. 26.

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LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 6 (August 7-20, 1962): The depth distribution of fish during and after an extensive upwelling, and the distribution of small coregonines (fresh-water whitefish), were the principal objectives of Cruise 6 in southeastern Lake Michigan by the U. S. Bureau of Commercial Fisheries research vessel Cisco.

A moderately strong upwelling near shore persisted throughout much of the cruise. According to unofficial reports from various sources, it extended as far south as Michigan City, Ind., at the southern extremity of the lake, and at least as far north as Grand Haven, Mich. Off Saugatuck, Mich., the coldest surface water temperatures (near 11° C. or about 52° F.) were within 3 or 4 miles from shore (out to depths of 10 or 15 fathoms), but strong currents and eroded metalimnions extended as far as 33 miles offshore (84 fathoms). Trawl hauls in shallow water during and after an upwelling on August 15 and 17 indicated drastic changes in fish distribution as shown in table.

Number of Different Species Caught by M/V Cisco in Shallow Water

Date (Aug.)	Depth (Fms.)	Bottom Water Temperature (°F.)	Species 1/				
			Chub	Yellow perch	Alewives	Smelt	Trout-perch
15	5	47	4	1,600	48	18	0
15	7	46	34	138	22	62	78
17	7	64	0	30	60	2	4
15	10	44	45	470	51	47	3
17	10	62	0	7	43	1	21
15	12	43	154	704	7	28	0
17	12	60	3	83	12	7	14
15	15	42	199	38	29	32	0
17	15	51	28	450	17	51	112
15	17	47	485	178	50	138	3
15	20	42	365	0	12	0	0
17	20	46	304	2	23	5	1
15	25	41	75	0	2	0	0

1/In addition to the species shown in the table, a few spottail shiners were collected at depths of 5 to 12 fathoms, and moderate numbers of slimy sculpins at 15 to 25 fathoms. The chubs taken were Coregonus (Leucichthys) hoyi, with extremely few exceptions. About 75 percent of the yellow perch caught at 5 fathoms on August 15, and all of the perch caught at 7 fathoms on August 17 were yearlings; all other perch catches included very few yearlings, and no young of year.

Both yellow perch (except yearlings) and chubs moved into deeper, colder water as the cold water near shore was replaced. The chubs remained in colder water than the yellow perch, both during and after the upwelling. Smelt also moved out as the warm water moved in, but the distribution of alewives seemed to be unaffected.

Attempts to locate chubs less than 7 inches long with a midwater trawl, large-mesh half-meter plankton nets, and a 4-foot tow net of ¼-inch mesh (stretched) were unsuccessful. The midwater trawl, of a modified British Columbia design, caught a few alewives and C. hoyi (7.7 to 10.4 inches long) in several midwater tows over bottom depths of 15 and 40 fathoms. Fry, tentatively identified as alewives, were widely distributed in the upper 10 fathoms of water, out to a depth of at least 40 fathoms. Several alewife fingerlings (1.1 to 1.4 inches) were caught in the upper 15 fathoms of water, over the 30-fathom depth. Two fry, believed to be deep-water sculpin, were caught in a tow between 16 and 28 fathoms, over the 84-fathom depth.

Gangs of nylon gill nets were set at 40 and 84 fathoms to collect chubs for blood samples for an electrophoresis and serological study. The deeper set made a good catch of Coregonus kiyi, some of which were rather large.

Two days of the cruise were lost due to valve trouble on the main engine.

During Cruise 5 (July 17-31, 1962) the M/V Cisco was under contract to the U. S. Public Health Service. Hydrographic and bacteriological data were collected at 30 stations in southern and central Lake Michigan. No report on that cruise will be issued by the Bureau's Ann Arbor Biological Laboratory.

Note: See Commercial Fisheries Review, August 1962 p. 23.

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LAKE ERIE FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" (August 1962): The fish population survey in Lake Erie was continued by the U. S. Bureau of Commercial Fisheries. Operations of the research vessel Musky II in August included the seasonal three day-night series of trawl hauls (two 10-minute tows at each of three depths during the morning, afternoon, and evening) at stations 4 (East Harbor) and 49 (Bono) and the annual week-long cruise to seven index stations distributed about the western basin.

The summer series of three day-night trawl hauls provided further evidence of good spawning success and subsequent survival for most species of fish. Young yellow perch, white bass, and yellow pike (walleye) were particularly abundant as compared to other

recent years. Yellow perch were plentiful in all areas sampled; thousands were caught in many 10-minute drags of the trawl. Young yellow pike were abundant, but their distribution was less uniform (catches may have been influenced by meteorological conditions). A total of 447 young were taken at station 4 and 37 at station 49.

The fishery-limnological cruise to the seven index stations was conducted to preserve continuity and for comparison with similar operations of the past 3 years. Two trawl tows were taken at each station and turbidity, pH, temperature, alkalinity, and dissolved-oxygen content of the water were determined. The water was stratified at two of the stations (off Monroe, Mich., and north of Pelee Island), but no oxygen deficiencies were observed.

Growth of young-of-year fish of most species appeared to be about average. The mean length of young yellow pike at the end of August was about 7.0 inches, an increase of 2 inches over the preceding month. This represents slightly faster growth than in 1960 or 1961, but slower than in 1959. Average total lengths in inches of young fish of other species were as follows: yellow perch, 2.5; white bass, 2.7; gizzard shad, 4.2; sheepshead, 2.8; alewife, 3.8; smelt 2.1; spottail shiner, 2.1; and emerald shiner, 1.9.

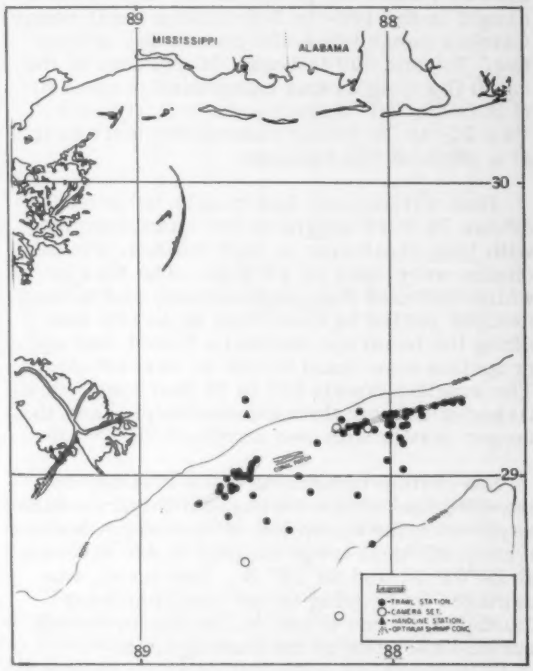
The large population of older perch is still dominated by 3-year-old fish of the 1959 year class. The average length of these perch is now 8.2 inches; they should reach about 8.5 inches toward the end of the Ohio commercial fishing season.

Water temperatures averaged 74° F. in the western end of the lake. Critically low dissolved oxygen was observed for the first time this year (toward the end of August) in the deeper areas of the central basin off Lorain, Ohio. Observations will be continued to determine the extent and duration of the deficiency.

Note: See Commercial Fisheries Review, September 1962 p. 26.

Gulf Exploratory Fishery Program

NORTHERN GULF OF MEXICO EXPLORATION FOR POTENTIALLY-VALUABLE DEEP-WATER SPECIES: M/V "Oregon" Cruise 79 (July 24-August 14, 1962): The primary objectives of cruise 79 by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon in the northern Gulf of Mexico were in two phases: (1) to explore the continental slope between 150 and 1,000 fathoms to assess the deep-water crustacean and fish potential of that area, and (2) to gather additional information on the seasonal distribution and occurrence of the royal-red shrimp (H. robustus) and a smaller deep-water shrimp (P. megalops).



Northern Gulf of Mexico explorations by M/V Oregon Cruise 79 (July 24-August 14, 1962).

A total of 60 trawl drags were completed during the cruise, 35 of which were made in the royal-red shrimp depth range between the Mississippi Delta and Pensacola, Fla. Royal-red shrimp were caught in small to moderate quantities--up to 109 pounds (heads-off) per 2-hour tow--in all drags completed between 200 and 260 fathoms with the largest catches in the 200- to 225-fathom depth range. Twenty-five tows completed in that depth range yielded 1,135 pounds of 31-35 count (heads-off) royal-red shrimp. Smaller deep-water shrimp (P. megalops) averaging 52 count heads-on were caught in quantities up to 150 pounds per 2-hour drag at depths ranging from 180 to 200 fathoms. The scarlet

prawn (P. edwardsianus) was caught most frequently in 350 fathoms--up to 4 pounds of the 10-count size were caught in each drag.

Large red crabs (Geryon sp.) were caught in 600 to 750 fathoms at rates up to 140 pounds (75 individuals) per drag. Young crabs of the same species were found to be heavily concentrated in 200 fathoms.

Hake (Urophysis sp.) and whiting (Merluccius sp.) were the predominant fish species caught in the 100- to 300-fathom depth range. Catches ranged to 1,000 pounds per 2-hour tow. Beyond 300 fathoms, 90 percent of the catch (by weight) was comprised of macrourids (suborder of Decapoda crustaceans). Two 20- to 25-pound macrourids were caught at a depth of 600 fathoms.

Both shrimp and fish trawls used on cruise 79 were rigged in the usual manner with loop chain and/or mud rollers. Tickler chains were used on all rigs. The trawls which included flat, semiballoon, and balloon designs varied in size from 40 to 130 feet along the headrope and were fished with appropriate size chain bridle or bracket doors. The smaller trawls (40 to 70 feet long) were fished with a single warp and bridle, and the larger trawls with two warps.

Sea bottom conditions were suitable for trawling operations throughout the area surveyed with the exception of one large concentration of coral trees located in 230 fathoms at 29°03' N. and 88°25' W. One trawl was damaged by bogging in the mud, and gear fouling occurred occasionally due to strong surface currents in the fishing area.

Sea bottom temperatures and sediment samples were obtained at each transectional trawling station between 150 to 1,000 fathoms. Marine life data were tabulated and entered on station sheets. Representative fish and shellfish samples were preserved and stored for future study by the Bureau's staff biologists.

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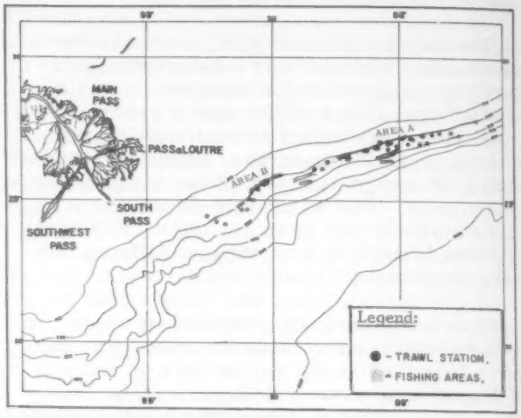
GOOD ROYAL-RED SHRIMP CATCHES BY RESEARCH VESSEL: M/V "Oregon" Cruise 80 (August 21-31, 1962): To determine the current production potential of royal-red shrimp (Hymenopenaeus robustus) in the areas east of the Mississippi Delta was the main objective of this 10-day cruise in the northern Gulf of Mexico. The areas worked on Cruise 80 had been delineated on previous cruises by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon, which returned to her base at Pascagoula, Miss., on August 31.



Northern Gulf of Mexico explorations by M/V Oregon Cruise 80 (August 21-31, 1962).

A total of 51 drags in the 200-300 fathom depth range between longitude 88°46' W. and 87°41' W. yielded 2,616 pounds of 31-35 count heads-off ungraded royal-red shrimp. Major fishing effort by the Oregon was concentrated in the two areas shown on the cruise chart as A and B.

Another 23 drags completed in 225 fathoms (optimum depth) in Area A yielded 1,393 pounds of 31-35 count heads-off shrimp. The best catch in Area A amounted to 130 pounds of heads-off shrimp in a 2-hour drag.

Eight tows made in 200 fathoms (optimum depth) in Area B produced 801 pounds of 31-35 count heads-off shrimp. The best catch was 261 pounds of 31-35 count heads-off shrimp in a 3-hour drag. Smaller catches (10 to 50 pounds heads-off) were made beyond the optimum depth range in both areas. Larger shrimp (21-25 to 26-30 count, all heads-off) were caught in small quantities in 240 to 250 fathoms at the western end of Area B.

Peneopsis megalops shrimp (average 52-count heads-on) were caught in amounts up to 183 pounds per two-hour tow at depths ranging from 190 to 200 fathoms.

A 900-pound sample of royal-red shrimp from both areas was graded, and yielded 500 pounds of 26-30 count (55 percent), 325 pounds of 40-50 count (36 percent), and 75 pounds of 50-60 count (8 percent) shrimp, all heads-off.

Hake (Urophysis sp.) and whiting (Merluccius sp.) dominated the fish species caught in Areas A and B beyond 200 fathoms. Catches of those species combined ranged to 1,000 pounds per 2-hour drag. In Area B, large catches of macrourids (other species of crustaceans such as shrimp and lobsters) averaging 1,500 pounds per 2-hour drag were caught in 190-195 fathoms.

Two broadbill swordfish (Xiphias gladius) weighing 46 and 57 pounds each were caught in one trawl tow in 190 fathoms in Area B.

A two-seam 2-inch mesh nylon balloon-trawl measuring 112 feet along the headrope and fished with 14-foot chain bridle doors, was used in the production trials. The trawl was fished with both loop chain and mud rollers and was equipped with a tickler chain. No difficulty was experienced in fishing the area, and gear damage and fouling was negligible. Some catches were lost in Area B due to shark damage to the cod end. That was overcome by the addition of a twine and chain cover over the cod end.

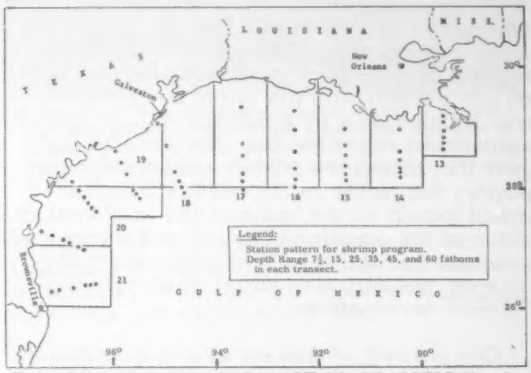
Bottom temperatures in the red shrimp depth range varied from 9° C. to 12° C. (48.2° F. to 53.6° F.).

Information on gear used and results of catches was relayed by radiotelephone to interested industry members. A commercial shrimp vessel from Freeport, Tex., arrived on the red shrimp grounds and fished in company with the Oregon. Catches of 1 to 2 boxes of heads-off shrimp per three-hour drag were reported by the commercial vessel.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-26 (August 17-23, 1962): Shrimp catches by the research vessel Belle of Texas on this cruise were composed of 50 percent large brown shrimp (a little more than 100 pounds) counting 12-15 and 15-20 to the pound. The rest of the catches (better than 100 pounds) consisted of modest quantities of smaller brown shrimp ranging from 21-25 to 41-50 count per pound, and only a handful of white and pink shrimp. The best catches of small and medium brown shrimp were made in the 20-40 fathom depth range. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico) returned to her home port on August 23.



Shows the station pattern for Cruise BT-26 of the M/V Belle of Texas, August 17-23, 1962.

Five statistical areas were worked during the 7 day cruise, and a 45-foot shrimp trawl was used. One 3-hour tow was made in each of the 3 depth ranges in each area.

The largest single catches of 33 pounds each were in the 20-40 fathom depth range in 3 separate areas. These were all brown shrimp of 3 different sizes: 12-15 count in area 16, 21-25 count in area 15, and 31-40 count in area 13.

Area 14 yielded 28 pounds of 12-15 count brown shrimp in the 40-60 fathom depth, and 16 pounds of the same size brown shrimp in 20-40 fathoms.

The largest catch of any area was 59 pounds in area 15 which netted 24 pounds of 41-50 count brown shrimp and 5 pounds of 15-20 count white shrimp in the depth up to 20 fathoms, as well as the 33 pounds of 21-25 count shrimp from 20-40 fathoms. Less than one pound of 12-15 count pink shrimp was caught in 0-20 fathoms of that area.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Sept. 1962 p. 29.

Industrial Fishery Products

MENHADEN OIL STIMULATES GROWTH OF CHICKS:

Menhaden oil may have unique value in poultry feeds. A scientist at the Lipman Research Center, Augusta, Maine, conducted comparative tests on various poultry feeds. Chicks fed a mixture containing 1 percent menhaden oil and 5 percent poultry fat gained more weight than those fed rations containing 6 percent of either hydrolyzed animal and vegetable fat or poultry fat or various combinations of those fats with menhaden oil other than the combination of 1 percent menhaden oil with 5 percent poultry fat. Efficiency of feed utilization (feed consumed divided by weight gained) with the latter combination was equaled only by 6 percent of hydrolyzed animal and vegetable fat. The results suggest that menhaden oil in combination with poultry fat yields better results than one would expect on the basis of the total energy value of the combined fats. The findings were announced in the July 1962 issue of Poultry Science, the official journal of the Poultry Science Association.

One percent of fish oil in a broiler ration is very near the maximum ordinarily recommended and 2 percent is excessive. A taste panel judged the meat of broilers that had received 1 percent menhaden oil "acceptable," that of the ones which received 2 percent "questionable," and meat of broilers that received over 2 percent of the oil "unacceptable" because of "off" flavors.

The high rates of weight-gain and levels of feed efficiency obtained from menhaden oil and poultry fat raise the question as to whether or not the fish oil in combination with various other fats would yield results as good as, or even better than, the results with poultry fat. Further research also should show whether or not menhaden oil will retain its growth-promoting effect in the presence of an antioxidant such as ordinarily is added to a highly unsaturated oil.

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FISH SOLUBLES STIMULATE GROWTH OF CHICKS:

There is distinct evidence that fish solubles stimulate the growth of chicks. This finding was announced recently by a group of poultry nutritionists who analyzed data compiled at the U. S. Department of Agriculture's Research Center, Beltsville, Md., between 1952 and 1960. The analysis showed that 4-week-old chicks fed fish solubles were significantly heavier than were the controls that received no solubles. The average difference in weight was 6 percent. The number of chicks involved in the study was over 8,000. Half that number of chicks were fed a ration containing solubles but no other non-vegetable protein. The other half were fed an identical ration without solubles.

The nutritional study was made with growth data accumulated from routine feeding trials, in order to answer questions as to the growth-promoting effect of fish solubles (the liquid separated from fish in the production of fish meal and oil is called fish solubles). Most investigators who have worked with the product have reported that fish solubles are effective in promoting growth of chicks, but some groups have reported negative results. Because of such findings, many specialists have questioned the chick growth-stimulating property of fish solubles, and this prompted the Beltsville nutritionists to analyze the 8-year accumulation of data. With the new and more recent information at hand, there is little doubt that fish solubles stimulate the growth of chicks.

The study was conducted by the Agricultural Research Center's poultry nutritionists who used data obtained with crossbred male chicks between the ages of 6 and 28 days. Their findings were reported in the July 1962 issue of Poultry Science, the official journal of the Poultry Science Association.

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U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-July 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 7 months of 1962 was 41,219 short tons or 14.1 percent greater than during the same period of 1961. Domestic production was 1,012 tons or 0.6 percent higher, and imports were 40,207 tons or 31.8 percent greater than in the same 7 months of 1961. Peru continued to lead other countries with shipments of 123,859 tons during the first 7 months of 1962--41,709 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

U. S. Supply of Fish Meal and Solubles, January-July 1961-62 and Total for 1961

Item	January-July		Total
	1/1962	1961	1961
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	141,012	141,359	247,551
Tuna and mackerel	11,617	11,378	21,243
Herring	1,839	3,283	5,268
Other	12,481	9,917	37,203
Total production	166,949	165,937	311,265
Imports:			
Canada	27,232	26,265	38,218
Peru	123,859	82,150	151,439
Chile	7,157	8,080	12,074
Angola	-	1,433	1,543
So. Africa Republic	7,984	7,716	13,026
Other Countries	511	892	1,545
Total imports	166,743	126,536	217,845
Available fish meal supply	333,692	292,473	529,110
Fish Solubles:			
Domestic production 2/	72,534	62,789	112,241
Imports:			
Canada	1,006	699	1,001
So. Africa Republic	789	796	1,351
Other Countries	2,801	432	4,387
Total imports	4,596	1,927	6,739
Available fish solubles supply	77,130	64,716	118,980

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

The United States supply of fish solubles (including homogenized fish) during January-July 1962 was 12,414 tons more than during the same period in 1961. Solubles and homogenized fish of 72,534 tons manufactured from domestically-caught fish made up 94 percent of the 7-months supply in 1962.

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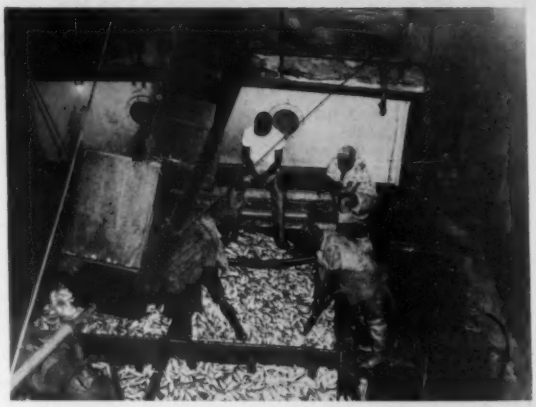
FISH MEAL, OIL, AND SOLUBLES:

U. S. Production, August 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for August 1962

U. S. Production 1/ of Fish Meal, Oil, and Solubles, August 1962 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles Homogenized 3/	
	Short Tons	1,000 Gallons	(Short Tons)	
August 1962:				
East & Gulf Coasts	34,664	4,166	14,581	-
West Coast 2/	2,633	288	2,226	-
Total	37,297	4,454	16,807	-
Jan.-Aug. 1962 Tot.	207,942	22,248	38,223	6,570
Jan.-Aug. 1961 Tot.	223,474	26,120	73,777	8,697

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.



At Moss Point, Miss., workers play heavy streams of water onto the fish in the hold of a menhaden vessel. This operation is necessary in order to make the menhaden flow into the standpipe and then through a discharge pump located on the dock of the fish reduction plant.

as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

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U. S. Production, July 1962: During July 1962, 52,600 tons of fish meal and scrap and 6 million gallons of marine-animal oils were produced in the United States. Compared with July 1961, this was a decrease of

Chemist examining fish meal scrap in a fish reduction plant at Empire, La.

U.S. Production of Fish Meal, Oil, and Solubles, July 1962, with Comparisons

Product	July		Jan.-July		Total
	1/ 1962	1961	1/ 1962	1961	1961
	(Short Tons)				
Fish Meal and Scrap:					
Herring	1,013	1,424	1,839	3,283	5,268
Menhaden 2/	47,474	57,459	141,012	141,359	247,551
Sardine, Pacific	-	-	689	-	2,518
Tuna and mackerel	1,649	1,673	2/11,617	11,378	21,243
Unclassified	2,438	2,879	11,792	9,917	14,757
Total	52,574	63,435	166,949	165,937	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	20,965	20,342	64,469	56,894	100,551
Homogenized condensed fish	1,200	2,247	8,065	5,895	11,690
	(Gallons)				
Oil, body:					
Herring	219,457	189,827	333,657	406,757	818,017
Menhaden 2/	5,601,930	7,057,597	16,675,825	18,105,058	31,355,570
Sardine, Pacific	-	-	19,111	-	86,167
Tuna and mackerel	64,170	65,608	325,553	292,825	762,509
Other (including whale)	128,315	318,461	474,057	692,948	1,386,542
Total oil	6,013,872	7,631,493	17,828,200	19,497,588	34,408,805

1/Preliminary data.
2/Includes a small quantity produced from thread herring.
3/Not available on a monthly basis.

10,900 tons or 17 percent in meal and scrap production and 1.6 million gallons or 21 percent in oil.

In July, menhaden meal amounted to 47,500 tons or 90 percent of the meal total and 5.6 million gallons of the oil production.

There were 21,000 tons of fish solubles produced in July 1962--600 tons above the same month of 1961. The production of homogenized condensed fish amounted to 1,200 tons--about 1,000 tons less than in July 1961.

During the first 7 months of 1962, meal and scrap production amounted to 166,900 tons--1,000 tons above the same period of 1961. The marine-animal oil yield totaled 17.8 million gallons--a drop of 1.7 million gallons.

* * * * *

Major Indicators for U. S. Supply, August 1962: For the first eight months of 1962, fish meal and fish oil production was lower by 5.2 percent and 12.0 percent, respectively, as compared with the same period of 1961. Fish solubles production showed an increase of 8.0 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, August 1962

Item and Period	1962	1961	1960	1959	1958
	(Short Tons)				
Fish Meal:					
Production 1/:					
October	-	16,852	24,455	22,026	11,630
September	-	28,642	36,239	36,874	33,185
August	41,100	57,031	49,709	47,364	40,783
January-July	166,949	162,400	130,443	144,865	103,632
Jan.-Dec. prelim. totals 2/	-	289,039	257,969	275,396	216,510
Jan.-Dec. final tots.	-	311,265	290,137	306,551	248,140
Imports:					
October	-	9,425	12,515	3,821	5,899
September	-	13,941	9,487	9,224	5,079
August	-	19,026	8,340	5,695	5,310
July	25,857	18,710	13,131	4,303	13,546
January-June	140,886	107,826	66,375	101,421	55,946
January-December	-	217,846	131,561	132,925	100,352
Fish Solubles:					
Production 3/:					
October	-	8,459	7,192	12,487	8,867
September	-	11,232	12,573	23,979	23,049
August	16,700	19,685	16,921	29,785	24,653
January-July	72,534	62,969	55,822	89,051	58,415
Jan.-Dec. totals	-	112,241	98,929	165,359	130,177
Imports:					
October	-	110	-	1,908	2,548
September	-	263	38	1,732	253
August	-	318	180	4,718	2,819
July	306	708	96	4,938	607
January-June	4,290	1,219	2,518	9,073	2,293
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567
	(1,000 Gallons)				
Fish Body Oils:					
Production:					
October	-	1,901	3,024	2,176	1,139

(Table continued on following page)

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, August 1962 (Contd.)

Item and Period	1962	1961	1960	1959	1958
	(1,000 Gallons)				
September	-	3,224	3,939	2,888	3,689
August	4,500	6,548	4,910	3,877	4,160
January-July 4/	17,828	18,815	12,572	12,318	9,620
Jan.-Dec. prelim. totals	-	33,471	26,690	24,418	21,625
Jan.-Dec. final tots.	-	34,416	27,886	24,978	22,028
Exports:					
October	-	2,027	591	1,911	3,591
September	-	1,269	1,861	1,129	665
August	-	1,774	186	2,449	752
July	17	589	5,414	3,770	791
January-June	8,401	9,084	7,043	6,581	4,320
Jan.-Dec. totals	-	16,331	19,154	19,264	12,539

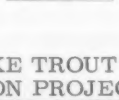
1/Does not include crab meat, shrimp and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
Note: Data for 1962 and 1961 are preliminary.

Irradiation Preservation

IRRADIATED CLAM MEATS TESTED FOR QUALITY IMPROVEMENT AFTER REFRIGERATION:

A series of sensory tests to determine if refrigeration of clam meats during irradiation results in a detectable improvement in quality was conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass. Initially, the vitamin content of clams sampled during the spawning season was determined by using a part of a sample which was irradiated at 350,000 rads 1/ and stored for 30 days at 33° F. The experiment showed no significant difference in quality after that period of storage.

1/Rad = The quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest. Erg = unit of energy.
Note: See Commercial Fisheries Review, April 1962 p. 24.



Michigan

NATURAL LAKE TROUT REPRODUCTION PROJECT COMPLETED:

A community conservation project which may set the stage for natural lake trout reproduction in Higgins Lake, Roscommon County, Mich., was completed early in August 1962, the State of Michigan Conservation Department reports.

The project is a new spawning reef for lake trout located about one mile out from the lake's west shore. The reef measures about half the length and twice the width of a football field in an area where the fish are known to concentrate during the fall spawning season.

Selection of the project site was also pinpointed by Michigan Conservation Department studies which showed the area is free of siltation, and has suitable water temperatures and currents for egg hatching.

Some 200 yards of broken concrete were hauled on barges and dumped in the area by Michigan Conservation Department fisheries workers to create the artificial spawning bar.

Lake trout are expected to place their spawn in crevices of concrete chunks where the eggs will be protected from predation by perch and mud puppies.

A skin-diving fisheries biologist will check the reef for eggs in early November during the fall spawning season. Plans also call for placing some boxes of lake trout eggs in the area to study hatching results.

Mullet

DEVELOPMENT OF NEW PRODUCTS:

Experiments towards finding new uses for mullet were conducted this summer by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Pascagoula, Miss., in a joint program with the Florida Conservation Department.

Butterfly mullet fillets cut from 500 pounds of fish were canned in brine at the Laboratory. The canned product was to go to Florida State institutions for consumer taste-testing. If the canned mullet is acceptable to Florida's State institutions along the Gulf and South Atlantic Coasts, it is believed that a new market could be developed for a large amount of unutilized fish.

Another 100 pounds of dressed mullet was shipped from Pascagoula to the Fishing Corporation's Research Department in Chicago in a joint program to use mullet in a smoked fish sausage. A meat packer in the Pascagoula area has agreed to try a consumer market test on the new product.

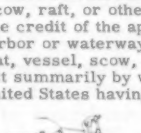
Navigable Waters

DUMPING ILLEGAL:

The dumping of petroleum products, garbage, and other refuse into the navigable waters of the United States with resulting pollution is of common concern to everyone.

The laws of the United States, Section 13 of the River and Harbor Act of 3 March 1899 (33 USC 407), make it unlawful to discharge, or suffer, cause, or permit the discharge of petroleum products, garbage, or other refuse matter of any kind or description into the navigable waters of the United States. This includes placement on shore or in tributaries so as to be washed into navigable waters; refuse thrown from shore is also included. Every person and every corporation that shall violate, or that shall knowingly aid, abet, authorize, or instigate a violation of this provision shall be guilty of a misdemeanor. Conviction carries a fine not exceeding $2,500 nor less than $500, or imprisonment for not less than 30 days nor more than one year, or by both such fine and imprisonment, in the discretion of the court. One-half of said fine is to be paid to the person or persons giving information which shall lead to conviction (Federal employees are not to benefit).

Section 16 of the River and Harbor Act of 3 March 1899 (33 USC 412) states that any boat, vessel, scow, raft, or other craft used or employed in violating any of the provisions listed above shall be liable for the pecuniary penalties specified above and in addition thereto for the damages done by said boat, vessel, scow, raft, or other craft, which latter sum shall be placed to the credit of the appropriation for the improvement of the harbor or waterway in which the damage occurred, and said boat, vessel, scow, raft, or other craft may be proceeded against summarily by way of libel in any district court of the United States having jurisdiction thereof.



Oceanography

COAST AND GEODETIC SURVEY TO PARTICIPATE IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

Plans were announced in August by the U. S. Coast and Geodetic Survey for its vessel Pioneer to participate in the International Indian Ocean Expedition. The program has been planned to cover areas where little has been done to date, and to supplement work of the other expeditions. The Pioneer is scheduled to sail in mid-February 1964 from San Francisco, Calif., and will return to San Francisco the following September. In addition to under way observations en route to and from the Indian Ocean, the Pioneer will concentrate on gravity, magnetic, and hydrographic operations in the Andaman Sea and in the eastern Bay of Bengal.

Three north-south profiles of oceanographic stations are planned from 5° N. to 5° S. across the Equator south of the Bay of Bengal. Between San Francisco and Honolulu the Pioneer will carry out track-line hydrographic, gravity, and magnetic observations for coverage between the West Coast and 155° W. Under way observations will include bathythermograph, surface salinity, and temperature, surface weather and upper air observations, visual observations of sea, swell, marine life, etc. Also included will be such under way biological observations as may be programmed by the biologists. From Honolulu to Guam, under way observations will continue along a track planned to cover a route not previously crossed for such observations. The Pioneer will make three crossings over the Marianas Trench. A similar program will be carried out with three crossings of the Phillipine Trench northeast of Samar. Under way observations will be continued to Manila. From Manila to Singapore, under way operations will continue with one long oblique crossing of the Palawau-North Borneo Trench.

From Singapore, the track will be northwest through the Malacca Straits into the Andaman Sea. Sediment cores and bottom photographs will be taken in the Andaman Sea. At the northern end of the Andaman Sea, special lines will be run to determine if submarine channeling extends seaward of the mouths of the Irrawaddi River.

From the Andaman Sea, the ship will pass into the Bay of Bengal where the under way operations, cores (or dredgings), and bottom photography will continue along a series of east-west lines from the coast of Burma out to approximately 88° E.

Special care will be taken along the more northerly of those lines to look for any southerly extension of the Ganges Canyon. The Pioneer will carry out a detailed survey of the Ganges Canyon seaward of the continental shelf, which will be traced as far seaward as possible. Cores will be obtained from the canyon floor, where possible, and attempts will be made to dredge the canyon walls. At the termination of this project the ship will proceed to Trincomalle, Ceylon.

When the Pioneer leaves Trincomalle, a supposedly existing canyon will be traced seaward with a set of profiles and an attempt will be made to dredge the walls. Upon completion of the Canyon Survey, three north-south sections of oceanographic stations will be occupied from 5° N. to 5° S. along 84° E., 88° E., and 92° E. The track to Djkarta is tentatively planned to accomplish two crossings of the northeastward extension of the trend of the Java Trench.

From Djkarta, under way observations will be carried out through the Java Sea, Macassar Strait, Celebes Sea, and from there to the Palau Islands. Under way observations will be continued to Guam. From Guam, three more crossings would be made of the Marianas Trench, and then to Honolulu along a line parallel to the track run on the way out. From Honolulu to San Francisco the track would be along one of the predetermined routes.

These preliminary plans are only tentative and may change as biologists and meteorologists' ideas take shape, and results of other ships operating in the Eastern Indian Ocean become available. (National Oceanographic Data Center Newsletter, August 15, 1962.)

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OCEANOGRAPHIC PROGRAM DEVELOPED BY DUKE UNIVERSITY:

Recent developments in the Biological Oceanography Program of Duke University's Marine Laboratory (located at Beaufort, N.C.) were announced in August. Much of the data collected under the program are to be given to the National Oceanographic Data Center, Washington, D. C. The laboratory's area of operations is likely to extend from Beaufort, N. C., south to Florida, and north to Virginia. Going eastward, the laboratory will probably concentrate its investigations in the Gulf Stream and the Sargasso Sea. The majority of the work scheduled in the program will be on shallow-water processes along the continental shelf, but some work will be done in deep water off Cape Hatteras.

The work to be undertaken will involve hydrographic observations, submarine geology, fisheries studies, and basic marine biological studies at sea. Those are the major aspects of the study programmed by Duke University, and also by various universities and laboratories involved in the Cooperative Ship Program.

As it now stands, the program has three major phases: (1) Cooperative Ship Program as a means of reaching the research goals of the cooperating agencies and institutions; (2) teaching of oceanography; and (3) graduate research in oceanography. (National Oceanographic Data Center Newsletter, August 15, 1962.)

Oregon

EFFECTS OF SEISMIC EXPLOSIONS ON MARINE LIFE PROBED:

Seismic explosions detonated by oil exploration crews operating off the Oregon coasts were charged to be seriously damaging fish, shellfish, and other marine life. The charges were to be probed in an investigation scheduled for September 6-7, 1962, by the Oregon Fish Commission. Oregon's water resources analyst for the State fisheries agency stated the initial biological experiment would be conducted off Astoria on September 6. That phase of the investigation was to determine if appreciable damage was being done to such species as sole, flounder, and Pacific ocean perch, which comprise a high percentage of Oregon's important trawl fishery landings.

A chartered Astoria trawler, the Betty, accompanied by the Shell Oil Company seismic boat Miss Ida, and an observer boat, were to move into an area between the Columbia lightship and Cape Falcon, in waters from 20 to 50 fathoms. When fish were located with fish-detection equipment, the trawler was to make two 1-hour tows, the second following as closely as possible the course of the first tow. At the end of the second tow, the seismic boat would begin detonating a series of charges suspended 3 to 5 feet beneath the surface along the same track, spacing the blasts at $\frac{1}{4}$-mile intervals. The powder charges were to be the same as those used in routine seismic work--5-pound charges in water up to 200 feet in depth, and $16\frac{2}{3}$ pounds in water deeper than 200 feet. The trawler would again lay down fishing gear and follow closely behind the shot boat in an effort to determine if there were any change in abundance of fish. A second post-blast tow would be made back along the shot line in an attempt to pick up possible fish kills sinking to the bottom.

Catches were to be analyzed closely for species composition, size composition, total poundage, and for dead or injured fish. The catches were to be retained aboard the trawler and later marketed in the regular manner by the fisherman. Filleting operations were to be observed by Oregon Fish Commission biologists for signs of damage to individual fish attributed to the seismic explosions.

Expenses for the biological investigation are to be paid by the oil companies engaged in seismic operations.

In another phase of the project, Dungeness crabs of various sizes held in commercial crab pots in waters off Newport were to be subjected to typical seismic explosions. Half of the experimental pots would be pulled for examination immediately following the explosions, while others would be left for 72 hours to determine if there was any delayed mortality. Crabs held in pots not subjected to explosions were to be compared with experimental animals. The Oregon State Police were to provide a boat and crew to assist Oregon Fish Commission biologists in conducting that phase of the investigation.

SCUBA divers from both the Washington Department of Fisheries and Oregon Fish Commission were to make underwater observations during the two phases of the study.

Oysters

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF AUGUST 17:

Setting of Starfish: Observations showed that setting of starfish continued from the latter part of July through the middle of August 1962, reports the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn. With the exception of the Bridgeport area, setting remained very light, especially in New Haven Harbor where virtually none occurred during that period.

Setting of Oysters: Examination of plankton samples collected on July 30 showed an almost complete absence of bivalve larvae. The situation had improved somewhat by August 2 when only two early umbo oyster larvae were found. On August 6 a small number of young oyster larvae was found at 3 stations and at a recently established station, but none was found at another station. The majority of the larvae was less than 150 microns long.

Samples collected on August 13 contained a few oyster larvae at 4 stations, but none at another station. The majority of the larvae was less than 200 microns long except for several that were somewhat larger, and up to 290 microns long. The larger larvae were found at stations established in Lewis Gut.

Plankton samples collected on August 16 indicated irregular distribution of larvae. But since a comparatively large number of mature larvae was found at the New Haven and Bridgeport stations, an increase in intensity of setting may develop in the vicinity of those two points. It is also possible that the small patches of oyster larvae found at 2 stations may be carried by currents for some distances before they set.

Setting of oysters began July 18, but was largely confined to 3 stations in the New Haven area. That wave of setting continued until about July 29 and then ended, without spreading to other areas, especially Bridgeport. With the exception of a single spat recorded from time to time on some collectors, virtually no setting of oysters occurred at any of the stations from the latter part of July to the middle of August.

An auxiliary station was recently established in the Bridgeport area at the point where 4 lots join. The new auxiliary station serves as the control for the stations established in Lewis Gut, which had been chemically treated, and also because several oyster companies planted shells in that area. (Bulletin No. 3, August 17, 1962, issued by the Milford Biological Laboratory.)

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LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF AUGUST 27:

Setting of Oysters: As reported earlier in August 1962, the first wave of oyster setting, confined largely to the New Haven stations, continued until about July 29 and then virtually ceased. However, the presence of a comparatively large number of mature larvae, found around August 16 at a station in New Haven and one in Bridgeport, indicated a second wave of setting, reports the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn. This proved to be correct and on August 17 oysters began to set in shallow stations in Milford and 2 stations in the New Haven area. The Bridgeport stations showed a light set until about August 22 when a good number of recently-set oysters were found on the collectors from a Bridgeport station.

At one station located near Lighthouse Point in New Haven Harbor, the second wave of setting had been comparatively light but continued, while at a recently-established station in Bridgeport oysters set rather heavily on August 23. Judging that the majority of recently-set oysters found on the collectors on August 23 were less than one day old, setting was expected to continue for several days. This is especially true of 2 stations in the Bridgeport area.

Setting of Starfish: Contrary to the increase in intensity of setting of oysters, starfish setting remained light throughout the oyster-producing area, especially at the shallow stations of Milford and all stations of the New Haven area.

Development of Method for Chemical Control of Oyster Enemies: Continuing observations under natural conditions on the effectiveness of the Milford method upon

Biologists of U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn., spraying a chemical over oyster drill-infested bed.

boring gastropods, an experiment was conducted in cooperation with the Northern Oyster Company, Inc., at Fireplace, Long Island, where ten acres of oyster bottom heavily infested with drills were covered on August 10 at the rate of 3.5 yards of chemically-treated sand per acre. After the treatment, a trap line (with 10 traps baited with mussels) was placed across the treated area and an identical line was placed on the untreated section. One week after the treatment the trap lines were fished and examined. The examination indicated that over 90 percent of the drills on the treated area were killed. A week later examination of the traps gave only 6 drills and no starfish, while the traps from the control area contained 306 drills and 74 starfish. Thus, 2 weeks after treatment the population of drills on the treated area was reduced by approximately 98 percent.

In connection with this experiment it should be emphasized that the Fireplace oyster bed, located near the tip of Long Island, lies virtually in the open ocean at a considerable depth. Thus, treatment of such an area presented many difficulties, nevertheless, it apparently has been a success. Properly trained employees of the Northern Oyster Company, Inc., will continue trap studies as long as neccessary.

Observations in Lewis Gut, Bridgeport, which was treated earlier in the season, indicate that drills are still virtually absent.

In trying various anti-drill compounds last year, two experimental lots in New Haven Harbor were treated with different quantities of a crystalline material, paradichlorobenzene. The treatment reduced the drill population but not as effectively as the mixture of sand, Polystream and Sevin. At present, tests are being made to determine whether the addition of Sevin to crystals of paradichlorobenzene increases its effectiveness against drills. Laboratory experiments conducted so far indicate that when Sevin is added to paradichlorobenzene the drills are affected more quickly and more severely. This experiment will continue and may develop into another modification of the basic method developed by the Laboratory. (Bulletin No. 4, August 27, 1962.)

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FUNGUS PARASITE THAT KILLS OYSTERS TO BE STUDIED:

Research on a fungus parasite that is killing oysters in the Gulf of Mexico and South Atlantic is to be conducted by a marine biologist of the Texas Agricultural and Mining College.

The marine biologist will investigate the effects of antibiotics on fungus parasites in oysters with the help of a $5,175 grant from the National Institutes of Health. He is an assistant professor of oceanography at Texas A & M College, and will conduct his research at the College's Marine Laboratory at Fort Crockett, Galveston.

The fungus parasite (Dermocystidium marinum) is the cause of considerable mortality to oysters in warm seasons in relatively high salinity ocean areas, the researcher said. Oyster beds are being depleted drastically and the industry is failing.

The biologist doing the research will conduct physiological and nutritional studies of oysters under laboratory conditions. All commercially available antifungal antibiotics will be tested for effects on the oyster fungus parasite. (Science News Letter, September 1, 1962.)

Shrimp

RESEARCH PROGRAM EXPANDED:

The Gulf of Mexico shrimp research program of the U. S. Bureau of Commercial Fisheries will be expanded this year because of the additional funds voted by the United States Congress. The sharp drop in landings of shrimp from the Gulf of Mexico in 1961, because of unknown natural factors, emphasized the need for more knowledge about the causes of fluctuation in this important marine resource. Commercial landings by Gulf fishermen in 1961 were little more than half the amount expected normally. With the addition of $325,000 this year, the Bureau's biological research program, aimed at ultimately developing a method of predicting the seasonal abundance of shrimp and better management of this valuable resource, will reach a level of $750,000 annually.

Another $100,000 has been added to studies of fishing gear improvement in the hope of reducing costs through more efficient shrimp fishing. A considerable amount of research has been done along this line, but it needs to be accelerated, because of the constantly increasing pressure of competition of foreign fishery products in the United States markets. Price is one of the competitive factors, and under normal producing conditions United

States fishermen must seize every opportunity to hold a favorable position.

Because of the wide-spread interest in shrimp research by all of the States bordering the Gulf of Mexico, the Gulf States Marine Fisheries Commission sponsored a joint meeting between Federal representatives and State research men early in September to work out final details of the expanded shrimp research program.

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UNITED STATES SHRIMP SUPPLY INDICATORS, AUGUST 1962:

Item and Period	1962	1961	1960	1959	1958
		(1,000 Lbs., Heads-Off)			
Total Landings, So. Atl. and Gulf States:					
October	-	12,696	21,690	19,601	16,462
September	-	9,691	18,832	18,331	15,847
August	11,200	10,944	20,441	18,595	14,173
January-July	44,200	41,530	58,521	53,004	49,555
January-December	-	91,395	141,035	130,660	116,552
Quantity canned, Gulf States 1/:					
October	-	2,307	2,567	2,531	3,489
September	-	785	2,236	2,108	2,825
August	1,400	1,206	5,041	2,427	2,809
January-July	11,600	8,447	16,159	14,023	11,914
January-December	-	15,760	28,594	24,679	26,404
Frozen inventories (as of end of each mo.) 2/:					
October 31	-	17,611	31,209	33,057	24,620
September 30	-	13,361	26,119	18,079	16,896
August 31	4/	12,728	20,171	23,780	15,274
July 31	13,677	14,849	17,397	22,357	12,351
June 30	13,796	19,416	15,338	19,283	10,664
May 31	13,904	24,696	17,540	21,137	11,013
January 31	-	31,842	34,332	30,858	17,963
Imports 3/:					
October	-	16,831	14,211	15,340	11,463
September	-	8,629	8,190	7,541	7,620
August	4/	6,743	6,407	5,107	6,628
July	8,265	6,635	7,319	7,861	6,340
January-June	64,001	57,168	51,365	49,826	32,278
January-December	-	126,268	113,418	106,555	85,393

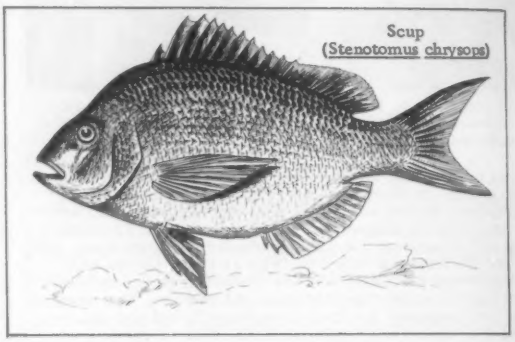
1/Pounds of headless shrimp determined by multiplying the number of standard cases by 33.
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
4/Not available.
Note: Data for 1962 and 1961 are preliminary. August 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

South Atlantic Exploratory Fishery Program

ANIMAL LIFE EXPLORATIONS OFF NORTH CAROLINA COAST:

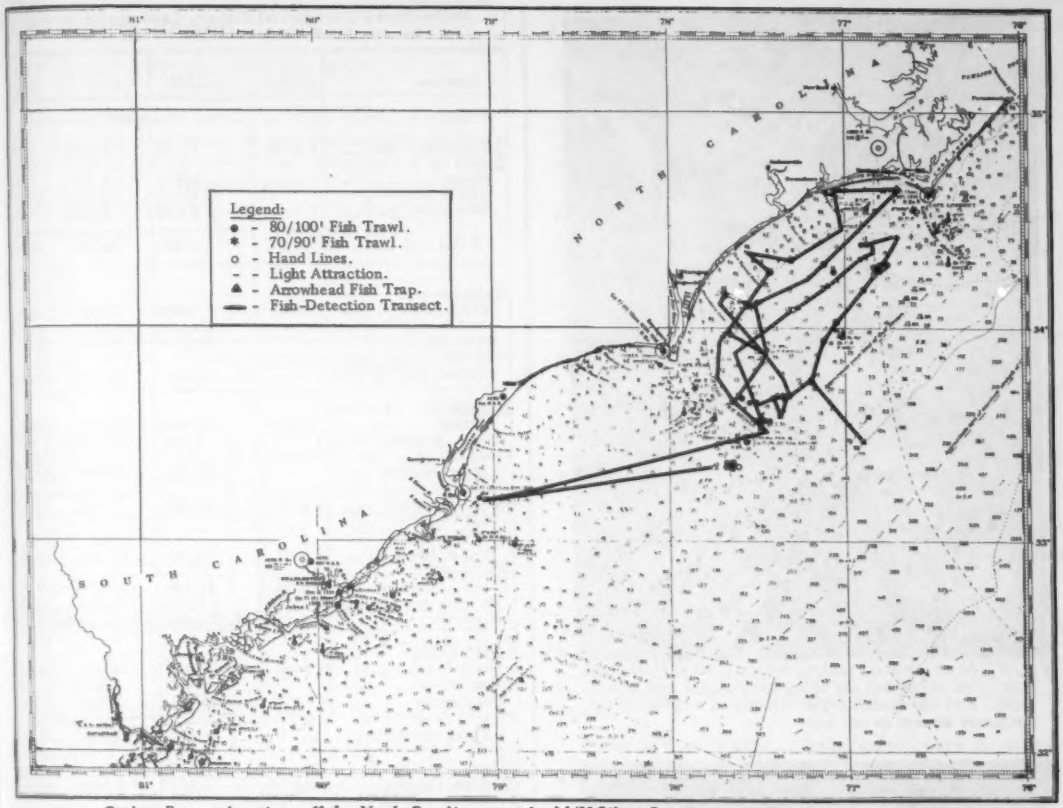
M/V "Silver Bay" Cruise 40: To assess the animal life in Onslow Bay off the North Carolina coast, an 18-day trip was made by the exploratory fishing vessel Silver Bay of the U. S. Bureau of Commercial Fisheries. The vessel returned to its base at Brunswick, Ga., on August 6, 1962.

Approximately 425 miles of "searching" transects were made between Capes Lookout and Fear. Most fishing was done with 70/90- and 80/100-foot roller-rigged nylon fish trawls. An arrowhead fish trap and hand lines were also used, and the white-line depth-recorder was used for fish detection.


Scup
(Stenotomus chrysops)

Extensive areas of slab rock caused some gear damage even though much of the sea bottom appeared trawlable on the depth recorder. Total catches ranged up to 2,300 pounds per 90-minute drag. Scup (Stenotomus chrysops) were the dominant species, ranging up to 1,500 pounds per drag. Small amounts of spot-tail pinfish (Diplodus holbrooki), up to 250 pounds per drag, were caught throughout the area in nearly every drag. Most scup averaged three fish to the pound and the spot-tail pinfish averaged one pound each. Over broken bottom areas, catches of vermilion snapper (Rhomboplites aurorubens) ranged up to 600 pounds per drag. Red snapper (Lutjanus blackfordi) up to 68 pounds per drag, and grouper (Myctero-perca sp.) up to 30 pounds per drag were caught in trawls, traps, and by hand lines. Extensive fish tracings of large concentrations of midwater and near-bottom fish were recorded throughout Onslow Bay. These were believed to be scad (Decapterus sp.) with catches in large-mesh fish trawls of up to 900 pounds per drag.

It appeared at that time of year that fish species (primarily scup) commonly found north of Cape Lookout inhabit the inshore area of Onslow Bay. Snapper and grouper, which are commonly found south



Onslow Bay explorations off the North Carolina coast by M/V Silver Bay Cruise 40 (July 19-August 6, 1962).

of Cape Fear, were found also in the offshore area of Onslow Bay. The area beyond the 20-fathoms depth is still unexplored.

United States Fisheries

COMMERCIAL FISHERY LANDINGS, JANUARY-JULY 1962:

Total Landings: Landings of fish and shellfish in the United States during the first 7 months of 1962 were 5 percent less than during the same period of 1961. The decline was due largely to a sharp drop in menhaden landings.

Menhaden: Total landings for the first 8 months of 1962 amounted to 1.6 billion pounds--177 million pounds less than for the same period in 1961. The catch was off sharply in the New England, Middle Atlantic, and Gulf States.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch for the 1962 season totaled approximately 272 million pounds--a gain of 7 million pounds compared with the 1961 season.

Shrimp: The South Atlantic and Gulf States landings through August 1962 amounted to about 93 million pounds, an increase of 5 million pounds as compared with the same period in 1961.

Fig. 1 - Scene inside a crab plant in Biloxi, Miss. Some plants use rotary washers for cleaning the debacked crabs.

Fig. 2 - At an industrial fishery products plant in Moss Point, Miss., raw menhaden are being carried on a belt into the plant. Fish are carried either directly to a cooker or to temporary storage in raw box.

Fig. 3 - Oyster shucker in a New Orleans oyster plant. Shucker cuts muscle holding the top shell of the oyster, after billing oyster with hammer.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1962 and 1961

Species	Period	1/1962	1961	Total 1961
		(1,000 lbs.)		
Anchovies, Calif.	7 mos.	1,300	2,560	6,590
Cod:				
Maine	6 mos.	1,400	1,507	2,507
Boston	7 "	14,500	13,226	18,837
Gloucester	7 "	2,000	1,615	3,358
Total cod		17,900	16,348	24,702
Haddock:				
Maine	6 mos.	900	1,299	2,940
Boston	7 "	53,800	52,297	84,093
Gloucester	7 "	10,200	9,033	15,025
Total haddock		64,900	62,629	102,058
Halibut 2/:				
Alaska	7 mos.	21,500	18,831	25,077
Wash. & Oreg.	7 "	8,400	10,792	14,947
Total halibut		29,900	29,623	40,024
Herring, Maine	7 mos.	58,800	11,699	54,463
Industrial Fish, Me., & Mass, 3/	7 mos.	24,300	22,521	41,851
Mackerel:				
Jack	7 mos.	41,200	29,824	102,958
Pacific	7 "	19,300	20,628	38,426
Menhaden	8 mos.	1,614,400	1,791,059	2,308,000
Ocean Perch:				
Maine	6 mos.	36,800	39,887	77,350
Boston	7 "	400	320	701
Gloucester	7 "	38,700	34,946	53,991
Total ocean perch		75,900	75,153	132,042
Salmon, Alaska	Year	272,000	264,814	264,814
Sardine, Pacific	to Sept. 6	12,000	8,801	43,169
Scallops, sea, New Bedford (meats)	7 mos.	12,100	11,851	20,648
Shrimp (heads-on):				
So. Atl. & Gulf	8 mos.	93,100	88,156	153,500
Washington	7 "	800	951	1,459
Squid, Calif.	7 "	6,900	1,064	5,400
Tuna, Calif.	8 "	208,400	225,214	307,263
Whiting:				
Maine	6 mos.	4,500	2,279	14,147
Boston	7 "	100	63	144
Gloucester	7 "	21,700	24,296	51,598
Total whiting		26,300	26,638	65,889
Total all above items		2,579,500	2,689,533	3,713,168
Other 4/		367,000	408,637	1,441,832
Grand Total		2,946,500	3,098,170	5,155,000

1/Preliminary.
2/Dressed weight.
3/Excludes menhaden.
4/Includes landings for species not listed.
Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) amounted to about 208 million pounds through August 1962--17 million pounds less than for the same period in the previous year.

Maine Herring: Landings through July of this year (58.8 million pounds) were up 47 million pounds--a sharp increase over the same period of 1961. The 28 million pounds caught in July almost doubled the amount taken in the first half of the year.

U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, AUGUST 1962:

During August 1962, a total of 42 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 41 in August 1961. There were 22 documents cancelled for fishing vessels in August 1962 as compared with 26 in August 1961.

Table 1-U.S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, August 1962 with Comparisons

Area (Home Port)	Aug. 1962	Aug. 1961	Jan.-Aug. 1962	Jan.-Aug. 1961	Total 1961
	(Number)				
Issued first documents 2/:					
New England	2	5	22	26	33
Middle Atlantic	-	4	2	9	12
Chesapeake	3	2	26	43	75
South Atlantic	10	5	31	34	47
Gulf	16	10	78	83	100
Pacific	10	13	110	137	149
Great Lakes	1	2	2	11	12
Puerto Rico	-	-	-	2	2
Total	42	41	271	345	430
Removed from documentation 3/:					
New England	2	2	14	13	20
Middle Atlantic	2	1	28	19	34
Chesapeake	4	5	17	26	28
South Atlantic	3	1	25	19	30
Gulf	2	10	71	70	103
Pacific	6	3	78	63	112
Great Lakes	3	4	15	12	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	22	26	252	222	341

1/For explanation of footnotes, see table 2.

Table 2-U.S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, August 1962

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	6	7
10-19	10	5
20-29	6	2
30-39	10	1
40-49	1	-
50-59	3	1
60-69	2	1
70-79	4	1
80-89	-	1
90-99	-	1
110-119	-	1
140-149	-	1
Total	42	22

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 30 in 1962, 2 in 1961, 8 prior to 1951, and 2 unknown. Assigned to areas on the basis of their home ports.
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

U.S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JUNE 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in June 1962 were down 29.7 percent in quantity and 8.2 percent in value as compared with the previous month. The quantity dropped more than the value because lower-priced imports declined more than higher-priced imports. Imports were down in June for fish blocks or slabs (decline mostly from Iceland), groundfish fillets other than ocean perch (decline mostly from Iceland), swordfish fillets, sea catfish fillets (decline mostly from Iceland), canned salmon (from Japan), frozen tuna (decline mostly from Japan, British West Africa, and Ecuador), canned sardines in oil (decline mostly from Norway and Denmark), canned crab meat (from Japan), canned lobster meat (from Canada), frozen shrimp (decline mostly from Mexico), and sea scallops (from Canada). The declines were partly offset by a gain in imports of ocean perch fillets (mostly from Canada), flounder fillets (mostly from Canada), halibut and salmon fillets (mostly from Canada), yellow pike fillets (from Canada), fresh and frozen salmon (mostly from Canada), canned tuna in brine other than albacore (mostly from Japan), frozen spiny lobster tails (increase mostly from Australia), canned oysters (mostly from Japan), and frozen frog legs (mostly from Japan).

Compared with the same month in 1961, the imports in June 1962 were up 1.1 percent in quantity and 16.5 percent in value. Imports were up this June for canned salmon (from Canada and Japan), canned tuna in brine (mostly from Japan), canned sardines in oil, canned sardines not in oil (mostly from South Africa), canned crab meat (mostly from Japan), frozen spiny lobster tails (increase mostly from Australia), frozen shrimp, and sea scallops (mostly from Canada). But imports were down for fish blocks or slabs, groundfish fillets other than haddock fillets, flounder fillets (mostly from Canada), sea catfish fillets, fresh and frozen salmon (mostly from Canada), frozen tuna, and canned oysters (mostly from Japan).

In the first six months of 1962, imports were up 14.6 percent in quantity and 23.3 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed in the first part of this year for nearly all imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs, canned salmon (mostly from Canada and Japan), frozen tuna (increase mostly from Japan, Peru, and British West Africa), canned tuna (mostly from Japan), canned sardines in oil, canned sardines not in oil, frozen shrimp, and sea scallops. Imports were down for the following products: cod fillets, haddock fillets, fresh and frozen salmon (mostly from Canada), canned bonito and yellowtail, canned oysters (mostly from Japan), and frozen frog legs. The increase in canned sardines in oil reflects the small Maine pack for the 1961 season.

U. S. Imports and Exports of Edible Fishery Products, June 1962 with Comparisons

Item	Quantity June 1962	Quantity June 1961	Quantity Jan.-June 1962	Quantity Jan.-June 1961	Value June 1962	Value June 1961	Value Jan.-June 1962	Value Jan.-June 1961
	(Millions of Lbs.)				(Millions of $)			
Imports:								
Fish & Shellfish:								
Fresh, frozen, & processed 1/	84.1	83.2	559.9	488.4	31.8	27.3	191.3	155.1
Exports:								
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen)	3.2	1.2	17.4	12.9	1.0	0.8	6.9	6.6

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in June 1962 were up 166.7 percent in quantity and only 25.0 percent in value as compared with June 1961. Exports of the lower-priced canned sardines not in oil and canned squid (to Greece and the Philippines) were much higher this June. There was some increase in exports of canned mackerel, canned salmon, and canned sardines in oil. But exports of the higher-priced canned shrimp (principally to Canada and the United Kingdom) were down.

Compared with the previous month, the exports in June 1962 were up 52.4 percent in quantity, and 42.9 percent in value. Exports were up for canned mackerel, canned salmon, canned sardines in oil, canned shrimp (principally to Canada and the United Kingdom), and canned squid (to Greece and the Philippines). There was a modest decline in exports of canned sardines not in oil.

Processed fish and shellfish exports for the first six months of 1962 were up 34.9 percent in quantity, but the value was up only 4.5 percent as compared with the same period of 1961. The following were exported in substantially greater quantities in 1962: canned mackerel and canned squid (to Greece and the Philippines). Exports were slightly higher for canned salmon and canned sardines not in oil. But exports were down for canned shrimp (principally to Canada and the United Kingdom) and canned sardines in oil. Since most of the increase in exports January-June this year was in the lower-priced products, the value did not increase at the same rate as the quantity.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 1, 1962, amounted to 37,272,804 pounds (about 1,774,895 std. cases), according to data compiled by the Bureau of Customs. This was 4.9 percent more than the 35,537,369 pounds (about 1,692,256 std. cases) imported during January 1-September 2, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds (about 2,812,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

AIRBORNE IMPORTS OF FISHERY PRODUCTS:

January-April 1962: Shrimp was the leading U. S. airborne fishery import during the first part of 1962. Shrimp accounted for 82.1 percent of the quantity and 83.1 percent of the value of airborne imports of fishery products in April 1962. All of the U. S. airborne shrimp imports during the first four months of 1962 originated in Central and South American countries. The leading suppliers of airborne shrimp imports during January-April 1962 were Venezuela with 40.9 percent of the total, Nicaragua with 28.5 percent of the total, and Panama with 18.1 percent of the total. Mexico was the most important supplier of fishery products other than shrimp during January-April 1962. The data as issued do not show the state of the product--fresh, frozen, or canned, but it is believed that the bulk of these airborne imports is fresh and frozen products.

U. S. Airborne Imports of Fishery Products, January-April 1962

Product and Origin 1/	April		Jan.-April	
	Qty. 2/	Value 3/	Qty. 2/	Value 3/
	Pounds	US$	Pounds	US$
Fish:				
Canada	-	-	1,000	368
Mexico	25,142	6,759	153,062	26,076
France	-	-	155	463
Rumania	100	997	100	997
Panama	7,807	1,312	7,807	1,312
Total Fish	33,049	9,068	162,124	29,216
Shrimp:				
Guatemala	11,272	6,702	66,068	34,085
El Salvador	23,410	16,880	125,744	84,721
Nicaragua	77,535	29,174	603,543	201,611
Costa Rica	18,742	8,458	52,411	21,245
Panama	150,840	75,928	384,068	194,540
Venezuela	197,322	109,891	865,847	415,895
Ecuador	-	-	12,210	3,440
Mexico	-	-	6,072	3,850
Netherlands Antilles	3,075	2,722	3,075	2,722
Total Shrimp	482,196	249,755	2,119,038	962,109
Shellfish other than Shrimp:				
British Honduras	15,210	8,813	61,884	38,550
Honduras	4,590	850	60,203	47,706
Costa Rica	-	-	1,400	1,247
Panama	-	-	1,040	1,011
Jamaica	13,288	9,664	28,188	20,544
Netherlands Antilles	12,398	8,580	14,159	9,264
Venezuela	3,560	1,466	22,263	13,624
Mexico	16,067	9,161	27,793	16,050
Guatemala	-	-	2,370	1,880
Leeward and Windward Islands	5,611	1,933	14,823	5,201
Nicaragua	-	-	390	281
Japan	-	-	26	330
France	70	212	150	419
Colombia	140	236	140	236
Ecuador	940	704	940	704
Total Shellfish (exc. shrimp)	71,874	41,619	235,769	157,047
Grand Total	587,119	300,442	2,516,931	1,148,372

1/When the country of origin is not known, the country of shipment is shown.
2/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
3/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the over-all import figures for total imports; i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, April 1962, U. S. Department of Commerce.

* * * * *

January-March 1962: United States airborne imports of fishery products during the first quarter of 1962 amounted to 1,929,812 pounds valued at $847,930. Shrimp and prawns accounted for 84.8 percent of the quantity and 84.0 percent of the value of the

U. S. Airborne Imports of Fishery Products, January-March 1962

Product and Origin 1/	January-March 1962 Quantity 2/	Value 3/
	Pounds	US$
Fish:		
Canada	1,000	368
Mexico	127,920	19,317
France	155	463
Total Fish	129,075	20,148
Shrimp:		
Guatemala	54,796	27,383
El Salvador	102,334	67,841
Nicaragua	526,008	172,437
Costa Rica	33,669	12,787
Panama	233,228	118,612
Venezuela	668,525	306,004
Ecuador	12,210	3,440
Mexico	6,072	3,850
Total Shrimp	1,636,842	712,354
Shellfish other than Shrimp:		
British Honduras	46,674	29,737
Honduras	55,613	46,856
Costa Rica	1,400	1,247
Panama	1,040	1,011
Jamaica	14,900	10,880
Netherlands Antilles	1,761	684
Venezuela	18,703	12,158
Mexico	11,726	6,889
Guatemala	2,370	1,880
Leeward and Windward Islands	9,212	3,268
Nicaragua	390	281
Japan	26	330
France	80	207
Total Shellfish (exc. shrimp)	163,895	115,428
Grand Total	1,929,812	847,930

1/When the country of origin is not known, the country of shipment is shown.
2/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
3/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the over-all import figures for total imports; i. e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, January, February, and March 1962, U. S. Department of Commerce.

airborne imports in the first quarter of 1962. The leading suppliers of airborne imports of shrimp and prawns during the period were Venezuela with 40.8 percent of the total and Nicaragua with 32.1 percent of the total. The data as issued do not show the state of the product--fresh, frozen, or canned, but it is believed that the bulk of these airborne imports is fresh and frozen products.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, AUGUST 1962:

The August 1962 wholesale price index for edible fishery products (fresh, frozen, and canned) at 121.6 percent of the 1957-59 base was up 2.2 percent from the previous month, and was also higher by 10.1 percent from August 1961. Higher wholesale prices for fresh large haddock, fresh halibut, and salmon, and fresh and frozen shrimp this August were mainly responsible for the increase over July, but prices for Maine canned sardines dropped sharply from July to August.

Fig. 1 - Hand-weighing shrimp in a cannery located in Biloxi, Miss.

The fresh and frozen drawn, dressed, or whole finfish subgroup this August rose 6.7 percent from July. Prices this August were higher for all products in the subgroup, except for fresh Lake Superior drawn whitefish at Chicago (down 12.4 percent). Prices were higher at Boston for large ex-vessel haddock (up 11.4 percent), and at New York City for fresh dressed Pacific halibut (up 4.4 percent) and fresh dressed king salmon (up 7.7 percent). Great Lakes yellow pike at New York City was up 5.3 percent from July to August. Compared with the same month the previous year, the subgroup index this August was 15.4 percent higher. Substantially higher prices at New York City for fresh dressed halibut (up 23.6 percent) and fresh dressed king salmon (up 20.0 percent) and at Boston for large ex-vessel haddock (up 11.1 percent), were offset only slightly by the lower prices for Lake Superior whitefish (down 17.9 percent) and yellow pike (down 9.1 percent).

Higher fresh shrimp prices at New York City (up 8.3 percent) were responsible for a 3.7-percent increase in the processed fresh fish and shellfish subgroup index this August. The demand for shrimp was good and market conditions were even stronger despite some increase in seasonal South Atlantic shrimp landings. Prices for fresh haddock fillets at Boston were down 5.2 percent from July to August because of

Fig. 2 - View in front of wholesaler's stand in the "old shed" of the salt-water section of Fulton Fish Market, New York City. Boxed fish ready for shipment.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes 2/ (1957-59=100)			
			Aug. 1962	July 1962	Aug. 1962	July 1962	June 1962	Aug. 3/1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.6	119.0	118.3	110.4
Fresh & Frozen Fishery Products:					124.3	118.5	117.5	109.4
Drawn, Dressed, or Whole Finfish:					131.6	123.3	114.3	114.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.13	109.8	98.6	59.5	98.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.47	.45	138.9	133.0	130.1	112.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	1.05	.98	146.7	136.2	134.5	122.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.60	78.4	89.5	103.0	95.5
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.50	.48	81.9	77.8	73.7	90.1
Processed, Fresh (Fish & Shellfish):					117.6	113.4	120.6	113.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.37	.39	89.8	94.7	76.5	74.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.98	.90	114.3	105.5	121.9	101.4
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	126.5	126.5	126.5	134.9
Processed, Frozen (Fish & Shellfish):					117.8	113.3	112.7	97.4
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	100.1	98.9	96.3	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.35	.34	101.1	98.2	96.7	95.2
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	103.4	106.1	99.9
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.08	1.03	128.1	122.2	122.2	96.7
Canned Fishery Products:					117.4	120.1	120.1	112.5
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.50	28.50	124.2	124.2	124.2	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	107.9	107.9	107.9	97.7
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.25	118.5	118.5	118.5	101.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	11.31	119.4	145.1	145.1	132.2

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

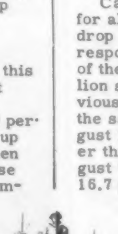
2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/Recomputed to be comparable to 1957-59=100 base indexes.

heavier small haddock landings as compared to the substantially lower landings of large haddock. When compared with August 1961, the subgroup index this August was 3.9 percent higher because of increased prices for fresh haddock fillets (up 21.2 percent) and a 12.7 percent increase in fresh shrimp prices at New York City.

The price index for processed frozen fish and shellfish this August rose 4.0 percent from July and was up 20.9 percent from August 1961. From July to August, the market was stronger for frozen shrimp at Chicago (prices were up 4.8 percent) because of very low supplies, and those prices were up 32.5 percent from August 1961. In August, prices for frozen haddock fillets were up 3.0 percent, ocean perch fillets rose 1.7 percent, and flounder fillets were up 1.2 percent as compared to the previous month. As compared with August 1961, prices for all fillets in the subgroup were higher.

Canned fishery products prices this August were unchanged for all items except canned Maine sardines. A 17.7-percent drop in canned Maine sardine prices from July to August was responsible for a 2.3-percent decline in the subgroup index. As of the end of August, the Maine sardine pack of about 1.5 million standard cases was about 3 times greater than the previous season's pack and prices were 9.7 percent lower than at the same time last year. Canned tuna stocks at the end of August 1962 were liberal, but prices were still 10.4 percent higher than a year earlier. Stocks of California sardines this August were about exhausted and prices for that product were 16.7 percent higher than in August 1961.



International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

PACIFIC HALIBUT FISHING IN AREAS 2 AND 1 ENDED SEPTEMBER 8:

The International Pacific Halibut Commission on August 29 announced the closure of Area 2 and Area 1 to halibut fishing effective at 6:00 p.m. (P.S.T.) September 8, 1962. The Commission estimated that the 28-million-pound limit set for Area 2 would be caught by the closing date. Area 1, which has no catch limit, will also be closed on the same date as Area 2.

In 1961, when Area 1 consisted of two areas, the part designated Area 1B closed on the same date as Area 2, but the part designated Area 1A was open to fishing until October 1. Fishing in Area 3A ended on August 11, 1962. Fishing in Areas 1, 2, and 3A is ended until the areas are reopened in 1963. Area 1 includes the waters south of Willapa Bay, Wash.; Area 2, the waters between Willapa Bay and Cape Spencer, Alaska; Area 3A, the waters between Cape Spencer and the Shumagin Islands of the Alaska Peninsula.

The official opening date for all halibut fishing in the North Pacific regulatory area this year was May 9 at 6:00 p.m. (P.S.T.), except that fishing in Area 3B South started on April 19 and Area 3B North started on March 28.

Areas 2 and 1 this year were open to halibut fishing for 122 days. Areas 2 and 1B were open for 120 days in 1961, 91 days in 1960, 68 days in 1959, 59 days in 1958, 47 days in 1957, and 38 days in 1956. Before the "lay-over" provision was adopted in 1956, halibut seasons were shorter. The "lay-over" rule requires halibut vessels to remain in port for a specified rest period after each trip. The fishing season in Areas 2 and 1B was only 24 days in 1955, 21 days in 1954, and 24 days in 1953.

Fishing in Area 3B South was to continue until 6:00 p.m. (P.S.T.) September 30, 1962. Fishing in Area 3B North was to continue until 6:00 p.m. (P.S.T.) October 15, 1962. Area 3B South includes the waters west of Area 3A, not including the Bering Sea. Area 3B North includes the waters in the Bering Sea.

Note: See Commercial Fisheries Review, September 1962 p. 52.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

FISHING PROBLEMS DISCUSSED AT INTERIM MEETING:

Top fisheries officials and experts of Canada, Japan, and the United States on August 22, 1962, concluded a week-long meeting in search of a solution of certain of their joint fishing problems in the northern North Pacific Ocean.

The main purpose of the special meeting, in which 27 persons took part, was to discuss expanding Japanese bottom-trawling operations in areas of the eastern North Pacific Ocean where Canadian and United States fishermen fish for halibut with long lines. Although Japan, under the terms of a tri-partite fisheries treaty, abstains from taking halibut in the eastern Bering Sea and the eastern North Pacific, her fishermen trawl for other species of groundfish in those areas. Since halibut and other groundfish are usually found on the same grounds, a difficult situation has arisen.

Up to the present, Japanese bottom trawling operations in the Gulf of Alaska have been limited to small-scale exploratory operations. North of the Aleutian Islands, in the eastern Bering Sea, both Japanese and Soviet trawlers have developed large bottom-fishing operations. Their total catch in 1961 was approximately 1.5 billion pounds. Halibut apparently formed a very small proportion of that catch.

Entry of a sizable fleet of trawlers from the U.S.S.R., which is not a signatory to the North Pacific Treaty, into the Gulf of Alaska has increased the complexity of the problem and strengthened pressure in Japan for entry of her fleets into the Gulf.

Discussions at the meeting centered on the question of how Japan may exercise her right to fish for species of groundfish other than halibut in the Gulf of Alaska in a way which will minimize damage to the halibut stocks, which Japan has agreed to abstain from fishing. Although final conclusions were not reached at the meeting, spokesmen for all the member countries expressed satisfaction at the degree of understanding of each others' problems which was achieved. It is believed that information developed at the meeting will enable the Commission to resolve the joint problems at its 1962 Annual Meeting, which will be held in Seattle, Wash., in November 1962.

An expert from the International Pacific Halibut Commission took part in the meeting of scientists and presented information on

International (Contd.):

recent surveys of the distribution and abundance of halibut in the Gulf of Alaska.

CENTRAL AMERICAN COMMON MARKET

COSTA RICA JOINS:

Costa Rica formally joined the Central American Common Market on July 23, 1962. The member states of the region which have now signed the General Treaty of Central American Economic Integration are Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

At the end of July representatives of those countries meeting in San Jose, Costa Rica, signed further agreements establishing uniform tariffs on more than 95 percent of all products entering the area.

In June 1962 Costa Rica and Nicaragua formally ratified the 10-year Treaty of Preferential Exchange and Free Trade, signed in August 1961 by Costa Rica, Nicaragua, and Panama. This tripartite agreement is similar to the Economic Association Treaty ratified by El Salvador, Guatemala, and Honduras in April 1960, and likewise aims at speeding the process of economic integration. Both agreements are allowed within the framework of the General Treaty of Central American Economic Integration. (Fortnightly Review, August 11, 1962, of Bank of London & South America, Ltd.)

Note: See Commercial Fisheries Review, May 1961 p. 31.

FOOD AND AGRICULTURE ORGANIZATION

FISHERIES DISCUSSED AT SIXTH REGIONAL CONFERENCE FOR THE NEAR EAST:

Two recommendations were sent to the Director-General of the Food and Agriculture Organization (FAO) with regard to fisheries by the Sixth FAO Regional Conference for the Near East held at Tel Amara, Lebanon, July 30 to August 8, 1962. The recommendations were: (1) to assist in training personnel, and (2) to advise member governments on the need for fish industry surveys. Member countries that have or are planning to increase the fishing industries in their countries include: Jordan, Kuwait, Lebanon, Saudi Arabia, Syrian Arab Republic, United Arab Republic, Pakistan, Sudan, and Libya.

The Conference was attended by Delegations from the following countries: Afghanistan, Iran, Jordan, Kuwait, Lebanon, Libya, Pakistan, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Republic, Yemen, France (representing French Somaliland), and the United Kingdom (representing Aden, Bahrein, Muscat and Oman, Qatar, and Trucial Oman). The following countries were represented by observers: Denmark, the Netherlands, and the United States. (United States Embassy, Beirut, report of August 16, 1962.)

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FISHING METHODS AND GEAR SEMINAR IN SOVIET UNION:

A seminar and study tour on fishing methods and fishing-gear technology, for participants from Asian and African countries, in the Union of Soviet Socialist Republics from August 18 to September 22, 1962, were sponsored by the Food and Agriculture Organization (FAO).

The seminar and tour were organized by FAO's Fisheries Division at the invitation of and in cooperation with the U.S.S.R. Government under the technical assistance program of the United Nations. The two-week seminar was held in Moscow; the tour lasted three weeks and covered fisheries in Astrakhan, Baku, Yalta, and other places of fishing interest.

Some 25 to 30 participants were expected to attend, most of them officers charged with developing fishing industries in their home countries. Most of the countries invited were tropical or subtropical and emphasis was on warm-water fishing from small and medium mechanized craft of 25 to 100 feet in length.

The seminar and tour concentrated on fishing methods of main importance in Asian and African countries--long-lining and gill-netting, trawling in shallow water for fish and shrimp, tuna fishing and fishing with various types of traps, encircling nets, and purse seines. It also studied electronic devices for fish detection, and attracting fish by light.

Director of the seminar and tour was provided by the U.S.S.R., with an associate director from FAO.

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International (Contd.):

WORLD MEETING ON TUNA BIOLOGY URGES EXPANSION OF TUNA RESEARCH: Fisheries biologists from around the world are urging stepped up efforts toward solving one of the sea's oldest riddles--the tuna--its behavior, migratory routes, spawning grounds, size of stocks, and the oceanic environment natural to each of the various species.

The international movement to supply answers to the many mysteries surrounding this most important of commercial fish comes as a result of the World Scientific Meeting on the Biology of Tunas and Related Species held in July 1962 in La Jolla, Calif.

At that 12-day meeting--first of its kind to be held on a global basis--248 scientists from 18 nations passed 20 resolutions, all of them designed to both expand and speed up all phases of world tuna investigation. One of the most important was for the Food and Agriculture Organization of the United Nations (FAO)--sponsor of the La Jolla meeting--to set up a Continuing Committee for the Facilitation of Tuna Research.

The proposed Continuing Committee would be made up of from 12 to 15 outstanding scientists from various countries, with a secretariat provided by FAO. The Committee will oversee the implementation of the Meeting's resolutions.

In a recent interview at FAO's Rome headquarters, the Director of the Organization's Fisheries Division said FAO has accepted the biologists' proposal and is now moving toward the establishment of the Committee. "We've needed such a committee for a long time," he said. "Most tunas live in international waters and practically all the maritime nations do at least some tuna fishing. These nations and their scientists are going to have to pull together if we are to make the fullest and wisest use of the sea's tuna resources."

Too Many Unknowns: Men have fished tuna since biblical times. Tunas are taken in all the world's oceans. There is no other major commercial fish that has such an international character. Since the end of the Second World War tuna fishing has developed into one of the world's greatest sea industries. During the past ten years alone the total catch has nearly doubled--from 500,000 metric tons in 1953 to just under a million this year. Japan and the United States, in that order, dominate tuna fishing, but Peru, France, India, Spain, Portugal, Italy, Norway, and West Germany also support thriving tuna fishing fleets and Australia, South Africa, Brazil, and several other nations, particularly the West African ones, are striving to enlarge their own tuna fisheries.

Despite all this, scientists and fishermen agree, there are still altogether too many unknowns about the fish. Where, for instance, are the great tuna spawning grounds? Just how many species and subspecies of tuna are there and what is the difference between them? What is the most efficient way to fish each species? What are the tuna migration routes? What is the life span of these fish? And perhaps most important of all, how much tuna can be taken without depleting the oceans' natural stocks?

It is to answer this last question that there is particularly chronic need for more and better catch and total-fishing-effort statistics.

"Aside from the obvious value of tuna fishing to a country's economy," the Fisheries Division Director said. "We need to take as much tuna as possible to help feed the world's explosively growing population. Tuna is a protein-rich fish and it is precisely protein that is most lacking in the diet of our already too numerous undernourished.

"But to fish tuna really scientifically, we need to know a lot more answers than we have now."

Food Through Research: It was because of this need for more answers that FAO decided to call the La Jolla meeting. As one scientist put it: "A much greater understanding of the oceans of the world is needed not only in explaining the availability of tunas, but also in relation to all the natural resources of the sea."

The La Jolla group expressed much interest in the forthcoming 27-nation International Indian Ocean Expedition. Among their recommendations, the scientists urged that the expedition study the Indian Ocean's tuna wealth and take advantage of the opportunity to test the latest fishing gear and methods of collecting larvae and young tunas.

The inclusion of tuna study in this expedition could go far toward stimulating tuna fishing in the countries bordering on the Indian

International (Contd.):

Ocean. All 27 of them are in need of greater supplies of protein rich foods.

On the systematics of tuna, the biologists recommended that a few major centers be selected for the housing of large scombroid fish collections. Three were cited as specially qualified: The United States National Museum of Washington, D. C., The Museum National d'Historie Naturelle of Paris, and the Fisheries Department of Kyoto University in Japan.

The biologists also called on all tuna fishing nations to launch wider tagging programs, using improved tags and better coordinated systems of recovery. Tagging has proved to be one of the best methods for identifying tuna stocks, growth, and migrations.

As Japan and the United States are the world leaders in tuna fishing, the Conference urged the two nations to carry out a joint cooperative study of the albacore and bluefin tunas of the Northern Pacific. Bluefin, the largest of the six major species, and albacore, a light meat tuna, make up the bulk of the Japanese and American tuna catches.

The other principal species are the bigeyed, yellowfin, skipjack, and the bonitos. In size, the tunas range from bonitos of less than 18 inches in length and 10 pounds in weight to the regal bluefins that sometimes reach 15 feet and more than 1,500 pounds.

West Africa is another potentially rich tuna fishing area that drew the La Jolla biologists' attention. They suggested that FAO aid West African countries in setting up a regional commission similar to the Inter-American Tropical Tuna Commission. The latter's work has greatly contributed to the development of tuna fishing in American waters.

A last important recommendation of the La Jolla group requested FAO's Director General to call a world meeting of experts on the economic aspects of tuna fisheries. FAO, the Fisheries Division Director reports, agrees such a meeting should be held.

"If all goes well," he said. "We'll try to hold it in late 1964 or early 1965."

Probable Future Trends: In the course of the La Jolla meeting, with so many of the world's finest tuna biologists on hand, predictions as to future trends inevitably came up.

Some of these were:

1. By 1970 the world tuna demand will probably reach 1.5 million tons, 50 percent again over present world landings. This means there is still plenty of room--room for all--for expanding the various tuna fisheries.

2. The greatest immediate increase in tuna catches will probably come not so much from further build up of the long-range fleets, but from increased development of coastal fisheries based on small, economical, locally-based vessels. These may well fish primarily for the smaller tuna-like fishes. Such a development should enrich local nutrition and, in time, put more tuna on the export market.

3. If the constantly rising demand for tuna is to be intelligently met with maximum benefit for all, consumer and fisherman, large and small fishing nations, research must march hand in hand with greater fishing effort.

The La Jolla scientists and their FAO colleagues believe that, now, perhaps it will.

The eight sections of the meeting covered species identification and distribution (adults, larvae, and eggs); population identification; size and composition of stocks; availability (accessibility and vulnerability); physiology and behavior; fishing methods; statistics of catch and effort; future lines of tuna research. There were also four working groups which considered blood samples; stock transfers; identification of larvae and juveniles; and tagging.

Presented at the meeting were 10 papers on methodology. Included were a review of the fishes of the family Scombridae, as well as distribution of eggs, larvae, and adults; subpopulation identification; size and composition of tuna stocks; matter of availability and harvest of tunas; behavior and physiology; fishing techniques for tunas and skipjack; need for statistics of catch and effort; future lines of research; and worldwide tuna research planning.

The 29 papers on species synopses included biological data on bonito (Sarda sarda), black skipjack (Euthynnus lineatus); bonito (Sarda orientalis); frigate mackerel (Auxis thazard); little tuna (Euthynnus affinis); Kuromaguro Thunnus orientalis; little tuna (Eu-

International (Contd.):

thynnus yaito); albacore (Thunnus germo); yellowfin tuna (Neothunnus macropterus); big-eyed tuna (Parathunnus mebachi); bluefin tuna (Thunnus thynnus); California bluefin tuna (Thunnus saliens); big-eyed tuna (Parathunnus sibi); skipjack (Katsuwonus pelamis); yellowfin tuna (Thunnus or Neothunnus albacares); bluefin tuna (Thunnus thynnus maccoyii and Thunnus thynnus orientalis); little tuna (Euthynnus alleteratus); albacore (Thunnus alalunga); blackfin tuna (Thunnus atlanticus); yellowfin tuna (Thunnus albacares).

In addition there were 40 experience papers and 9 information papers. The last of the information papers consisted of the resolutions of the Pacific Tuna Biology Conference, Honolulu, Hawaii, August 1961.

This meeting on the biology of the tunas was concerned both with the assessment of present knowledge and with the questions that may be asked of tuna biologists in the future.

The most obvious and dramatic aspects of the world tuna situation developed at the meeting were two: (1) Up for consideration was not an unutilized resource, nor a resource at the terminal stages of development, but rather one in mid-stream. Demand and yield have doubled approximately each ten years. Current landings are approximately 800,000 tons annually and there is every indication that market demand for 1,500,000 tons will exist by 1970. At this date, at least one population, the eastern Pacific yellowfin, has apparently reached the limits of its productivity. Indications are that other populations are responding to fishing in a predictable manner. This exponentially expanding demand on what must be a finite resource, will soon be the central biological problem before world tuna scientists, though at the moment the world-wide central problem appears to be the development of a more complete understanding of their ecology and behavior leading toward more efficient utilization of this valuable resource. (2) The resource is international in character. Excepting for whales, no other major, currently utilized fishery resource shares this character in such a spectacular way. Most of the tunas live in international waters, and modern fishing techniques and the modern means of distributing the product places no group of people in a favored position, excepting for very special situations. Tuna scientists around the world, then, must share global responsibilities for providing the scientific basis for the full and wise use of the tuna and tuna-like fishes.

The meeting principally indicated areas of research that seem to require acceleration, and/or changes in direction to the extent that the meeting has provided guidelines.

Note: See Commercial Fisheries Review, August 1962 p. 49.

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SIXTH REGIONAL CONFERENCE FOR ASIA AND THE FAR EAST:

The Food and Agriculture Organization (FAO) Sixth Regional Conference for Asia and the Far East was held at Kuala Lumpur, Federation of Malaya, September 15-29, 1962, to review the results in Asia and the Far East of technical and economic work in the fields of agriculture, fisheries, forestry, and nutrition over the two preceding years, and to consider at policy level the recommendations of the various technical meetings. This is one of the four regional conferences that are held at two-year intervals between sessions of the FAO Conference.

NORDIC COUNTRIES

CLOSER FISHERIES COOPERATION:

The Fisheries Ministers of Denmark, Finland, Iceland, Norway, and Sweden, at a meeting in Trondheim, Norway, in August 1962 agreed on the establishment of a Nordic liaison committee to coordinate fisheries policies of the five countries. The joint committee will comprise four representatives from each country. Two are to be named by the Government and two by national trade associations. The chairmanship will rotate among the countries.

In the opinion of the Fisheries Ministers, the Nordic liaison committee might consider advantageously such questions as taxation of the fish stock, fisheries research, price formations, commercial policy, standardization of packaging, and setting up a joint Nordic rescue service. Concrete proposals for a joint rescue service in the North Sea, now being drafted by a Danish-Norwegian-Swedish committee, were also discussed.

Norwegian fisheries researcher Finn Devold, in a report on Nordic herring fisheries over the past 50 years, told the Ministers that the herring quantity estimated in Norwegian waters in 1962 was only one-fourth as

International (Contd.):

large as it was six years ago. He saw some hope, however, that the influx of young fish might stem the steady decline in the stock of winter herring along the Norwegian coast. (News of Norway, August 23, 1962.)

UNESCO INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

ARABIAN SEA PHASE OF INDIAN OCEAN OCEANOGRAPHIC EXPEDITION DEFINED:

At the working meeting for coordination of the scientific program of the International Indian Ocean Expedition (IIOE), it was decided to enlarge the area covered by the discussion to include all the Arabian Sea sector north of latitude 10° S. Other conclusions reached by the working meeting held in Wormley, England, July 9-11, 1962, were:

(1) That a proposed aircraft study by the U. S. Weather Bureau of air-sea interaction during May-July 1963 will require continuous observations from 30 or more research vessels arranged in a geometric spacing of 100-200 miles.

(2) The 1960 Copenhagen recommendations concerning physical oceanography should be strengthened by decreasing station spacing to not in excess of 60 miles, and continuing all possible stations to the bottom.

(3) Special attention should be paid to: (a) the stagnant layers discovered by the Vityaz in the Arabian Sea; (b) hydrogen sulfide determinations made in the 625-1,000 meter layers; and (c) means taken to eliminate interference by hydrogen sulfide in the oxygen determination.

(4) A list of standard stations was established and two were recommended for the Bay of Bengal. Other standardization was recommended including the Worthington air equilibration technique as a standard for the Winkler titration.

(5) The unused cable between Madagascar and Africa should be investigated as a means of monitoring current flow by geokinetic electromagnetic means.

(6) A list of locations of desirable tide gauges was established.

(7) Additions were made to the list of biological collections and observations.

(8) The production of a bottom contour chart of the Indian Ocean by cooperative effort was encouraged.

Meetings were also scheduled for two other sections of the Indian Ocean. Those were for August 6-8 in Sidney, Australia, for the southeast quadrant, and later in the year for the Bay of Bengal sector, possibly in Bangkok, Thailand. (National Oceanographic Data Center Newsletter, Aug. 15, 1962.)

Note: See Commercial Fisheries Review, Sept. 1962 p. 58.

FISH MEAL

WORLD PRODUCTION, JUNE 1962:

According to preliminary data from the International Association of Fish Meal Manufacturers, world production of fish meal in June 1962 amounted to about 211,478 metric tons, an increase of 7.1 percent over world production in June 1961.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

World Fish-Meal Production by Countries, June 1962

Country	June		Jan.-June
	1962	1961	1962
	.... (Metric Tons)		
Canada	7,471	7,211	43,279
Denmark	10,641	9,315	38,870
France	1,100	1,100	6,600
German Federal Republic	3,857	5,564	36,121
Netherlands	200	700	2,400
Spain	2,236	2,427	13,712
Sweden	167	226	2,496
United Kingdom	6,787	6,399	37,648
United States	52,978	49,351	103,750
Angola	2,483	4,723	14,467
Iceland	5,400	3,715	32,330
Norway	10,739	14,876	30,684
Peru	83,819	68,718	544,442
South Africa (including South West Africa)	23,600	23,100	158,196
Total	211,478	197,425	1,064,995

Note: Belgium, Chile, Japan, and Morocco do not report their fish-meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish-meal production in June 1962 was mainly due to more output in Peru (up 22.0 percent), the United States (up 7.3 percent), Iceland (up 45.3 percent), and Denmark (up 14.2 percent). This year through June, Peru had increased landings of anchoveta; the United States had heavier landings of menhaden; Iceland's landings of herring were higher; and Denmark's landings of industrial fish were up. The increase was partly offset by a drop in fish-meal production in Norway (down 27.8 percent), Angola (down 47.4 percent), and Germany (down 30.7 percent). The herring fishery was a failure in Norway this year and Angola was plagued with organizational and marketing problems as well as declining catches.

Peru accounted for 39.6 percent of world fish-meal production (for countries listed) in June 1962, followed by the United States with 25.1 percent, and South Africa with 11.1 percent.

During the first six months of 1962, world fish-meal production for countries listed was 1,064,995 metric tons. Peru accounted for 51.1 percent of total production during that period, followed by South Africa with 14.9 percent, and the United States with 9.7 percent.

International (Contd.):

MARINE OILS

ESTIMATED WORLD PRODUCTION AND FOREIGN TRADE, 1958-62:

World production of marine oils (including whale and sperm whale oils, and fish and fish-liver oils) in 1962 is expected to increase, but at a lower rate than in the preceding three years. Increased production of fish oils will be partly offset by a decline in whale oil from the Antarctic. Sperm whale oil production from areas outside the Antarctic is expected to show a small increase.

Table 1 - Estimated World Production of Marine Oils, 1958-62

Type	1/1962	2/1961	2/1960	2/1959	1958
	(1,000 Short Tons)				
Whale	402	428	418	417	435
Sperm whale	126	124	122	130	135
Fish (including liver)	790	750	590	575	515
Total	1,318	1,302	1,130	1,122	1,085

1/Forecast.
2/Revised.

World exports of marine oils are expected to increase to another all-time high in 1962, but the increase will not be as large as in the preceding two years. Exports of fish oil and sperm whale oil will increase, but exports of whale oil will decline.

Table 2 - Estimated World Exports of Marine Oils, 1958-62

Marine Oils	1/ 1962	2/1961	2/1960	2/1959	2/1958
	(1,000 Short Tons)				
Whale	402	428	418	417	435
Sperm whale	126	124	122	130	135
Fish (including liver)	335	300	248	179	130
Total	863	852	788	726	700

1/Forecast.
2/Revised.
Note: Only exports from producing countries are included.

Production and exports of fish oil in 1962 are expected to increase because of greater output in Peru, Chile, and Iceland which produce mainly for export markets. A sharp drop in fish oil production in Norway will partly offset the increase in world production of fish oil, but will stimulate fish oil exports to Norway. Very little, if any, production increase is expected in the Republic of South Africa or the United States.

Edible vegetable oils compete with edible marine oils on the world market. Exports of edible vegetable oils are expected to be at an all-time high in 1962, exceeding last year's total by 25 percent. (Foreign Crops and Markets, U. S. Department of Agriculture, August 30, 1962.)

Note: See Commercial Fisheries Review, Nov. 1961 p. 41.

TRANSPORTATION

SELECTED OCEAN FREIGHT RATES FOR SELECTED FISHERY PRODUCTS AND BYPRODUCTS:

Product	Ocean Freight Rates	
	US$/Metric Tons	US$/Short Ton
From Callao (Peru) to Rotterdam (Holland) or Le Havre (France) or Hamburg (Germany):		
Fish meal: Up to Aug. 31, 1962	22.00	19.96
After Aug. 31, 1962	1/	1/
Fish oil: In bulk	16.00	14.51
In drums	22.40	20.32
Canned tuna: In cartons	30.80	27.94
In cases	2/26.60	2/24.13
	Shillings/ Metric Ton	US$/Short Ton
From Callao (Peru) to Liverpool (England):		
Fish meal: Up to Aug. 31, 1962	157	19.94
After Aug. 31, 1962	1/	1/
Fish oil: In bulk	114	14.48
In drums	160	20.32
Canned tuna: In cartons	220	27.94
In cases	190	24.13
	Shillings/Long Ton	US$/Short Ton
From Yokohama (Japan) to Rotterdam (Holland) or Hamburg (Germany):		
Fish oil: Contract rate	152 (plus 1 percent ad valorem)	19.00 (plus 1 percent ad valorem)
Non-contract rate	167.5 (plus 1.1 percent ad valorem)	20.94 (plus 1.1 percent ad valorem)
Canned salmon and canned tuna:		
Contract rate	3/208.5	3/26.06
Non-contract rate	230	28.75
	Shillings/Long Ton	US$/Short Ton
From Capetown (South Africa) to Rotterdam (Holland) or Hamburg (Germany) or Liverpool (England)4/:		
Fish oil in bulk5/:		
With a value up to £50 ($140) per long ton	113	14.12
With a value between £50-57 ($140-160) per long ton	135	16.87
With a value over £70 ($196) per long ton	150	18.75
Fish meal: In bags	149	18.62
	Shillings/40 Cubic Feet	US$/40 Cubic Feet
Canned sardines (pilchards)	134	18.76

1/Not available.
2/At ship's option, the rate may be $26.60 per 40 cubic feet of space.
3/At ship's option, the rate may be 208.5 shillings ($29.19) per 40 cubic feet of space.
4/Rates from Walvis Bay, South-West Africa, not available.
5/Rates established up to Dec. 21, 1962.
Source: United States Embassy, Copenhagen, August 29, 1962.

International (Contd.):

AFRICA

COMMON MARKET ESTABLISHED BY SIX NATIONS:

The establishment of an African Common Market was included among the seven economic agreements formulated at the Second Session of the Casablanca Powers' Economic Committee which met in Cairo, Egypt, March 26-April 2, 1962. The agreements, including the Treaty Establishing the African Common Market, were signed on April 2 by delegates of the six member nations: the Republics of Algeria, Ghana, Guinea, Mali, the United Arab Republic, and the Kingdom of Morocco.

The main purposes of the participating Governments in establishing the African Common Market are to achieve sustained economic growth, financial stability, and the full and rewarding employment of the human resources at its disposal. To bring about the most favorable conditions for promoting and regulating trade among them, and in conformity with the spirit and principles of the Casablanca Charter, the African Common Market is open to all independent African States on the following basis:

(1) More liberal trade for national commodities and products;

(2) Free movement of establishment rights, labor and employment for the development of economic activities;

(3) Freedom of transport, transit, and utilization of all means of communication, ports, and civil airports.

The Articles of five Sections comprising the Treaty establishing the African Common Market follow:

SECTION ONE: The Means: Article 1: In order to achieve the objectives of the Treaty, the Contracting Nations agreed:

(1) To establish a Customs Union among them, and to coordinate all customs tariffs, rules, and regulations that are applicable.

(2) To coordinate the import and export policies and all rules and regulations related to trade between them and to adopt a common policy regarding basic commodities.

(3) To unify customs regulations as regards specification and classification of products.

(4) To coordinate trade policies in fuel and power.

(5) To harmonize their social legislations.

(6) To establish organizations and agencies necessary for the implementation of the Treaty.

(7) To take all necessary measures for the realization of objectives planned.

SECTION TWO: The Provisions of the Treaty Customs Tariffs: Article 2: Each Contracting Party shall, within five years from the date of the coming into force of this Treaty, abolish all customs duties on its imports from the other member countries by a gradual reduction of the import levies on all products imported from member countries. This reduction shall be 25 percent during the first year. The percentage of reduction during the successive four years shall be determined by the Economic Committee of the Charter.

The reduction shall apply to the duties existing on March 31, 1962. After that date any member State which shall raise its duties shall not apply the increase to the rates applicable on the goods originating from other member States.

In order to safeguard their trade interests in certain manufactured products, two or more member States can conclude provisional bilateral agreements. A list of such manufactured products shall be decided on by mutual agreement.

Article 3. The reduction in customs duties, mentioned in Article 2, shall be made on all custom duties (fiscal and protective) levied on the imports of goods from member States of which goods are exempted if they are of local origin.

Article 4. A product shall be deemed of Common Market origin, benefiting from the reductions mentioned in Article 2, if it is either harvested or taken from the soil of the Common Market Countries, or manufactured in them. A manufactured product shall be considered a national product of a member country if it undergoes in the country concerned, a process of transformation amounting to at least 50 percent of its total cost of production.

Article 5. Each Contracting Party shall, by a progressive reduction, and within five years from the coming into force of the Treaty, abolish all restrictions on imports and exports of goods originating from the established African Common Market. This reduction shall be 25 percent during the first year.

Article 6. The Contracting Parties shall grant each other the most-favored-nation treatments as regards trade among them.

Article 7. The Contracting Parties shall give priority to the imports of goods from member countries.

Article 8. The Contracting Parties undertake to prohibit the re-export of both basic and manufactured goods to non-member countries unless otherwise agreed upon by the country of origin.

Article 9. Each Contracting Party shall facilitate the transit of goods from member countries through its territory, subject to the laws, rules, and regulations of its transit trade.

SECTION THREE: Administration: Article 10. The Contracting Parties shall establish a permanent body to be named "The Council of the African Common Market," hereinafter referred to as the "Council." The Council shall be entrusted with the implementation of the Treaty establishing the African Common Market. Its functions and powers shall be determined by the provisions of the present Treaty.

International (Contd.):

Article 11. (1) The Council of the Common Market shall be composed of one permanent representative for each State assisted by advisers.

(2) The Permanent Seat of the Council of the Common Market shall be at Casablanca and the Council may hold its meetings in any other place of its choice.

(3) The term of office of the President of the Council shall be one year. The Contracting Parties shall appoint a President to the Council by rotation.

(4) The Council shall convene periodic meetings every six months. It may hold extraordinary meetings whenever necessary.

(5) The decisions of the Council shall be taken by unanimous vote, each member country having one vote unless the matter is referred to the Economic Committee of the Casablanca Charter.

Article 12. The Council shall carry out its functions with the assistance of permanent or temporary committees. The Council may, however, entrust experts from among the nationals of the Contracting Parties with carrying out studies or research on specific questions.

Article 13. (1) The Council shall enjoy financial and administrative autonomy and shall have its own budget supplied by the member States. The Council shall submit annually, a draft budget to the Permanent Secretariat of the Charter which shall be entrusted with providing the necessary funds.

(2) The Council shall, at its first meeting, lay down its own rules of procedure.

Article 14. The Governments of the Contracting Parties shall appoint their representatives at the Council within a maximum period of one month from the date of the coming into force of this Treaty. The Council shall carry out its functions upon its formation.

Article 15. The Council shall carry out the functions and exercise the powers provided for in this Treaty and its annexes, as well as other prerogatives which may be deemed necessary for the successful implementation of the provisions of this Treaty, with special regard to the following:

(1) The implementation of the provisions of this Treaty and annexes, as well as all decisions taken in application of the present Treaty and annexes.

(2) The supervision of the work of its committees and subsidiary organs.

(3) The recruitment of personnel and experts responsible to the council itself, in conformity with the provisions of the present Treaty.

(4) Coordination of the Foreign Trade Policies of the Member States.

Article 16. The Council shall submit a report on its activities to the Economic Committee of the States of Casablanca Charter at each meeting of its members.

SECTION FOUR: Transitory Provisions: Article 17. When assuming its responsibilities, the Council shall take into consideration the special circumstances prevailing in some member countries.

Article 18. Two or more Contracting Parties may conclude closer economic agreements than those prescribed in this Treaty.

Article 19. Any member country desiring to conclude an agreement with any economic bloc or customs union outside the Casablanca Charter should first consult with the other Contracting Parties. Under no circumstances must an individual agreement prejudice the interests of the African Common Market.

SECTION FIVE: Ratification and Admission: Article 20. This treaty shall be ratified on June 1, 1962 at the latest, by the Contracting Parties in accordance with their respective constitutional procedures. The instruments of ratification shall be deposited at the Permanent Secretariat of the Charter. Each deposit shall be recorded and other contracting parties shall be notified.

Article 21. Any African State joining the Casablanca Charter in the future shall, at its request, be admitted as a Contracting Party to this Treaty.

Any African non-member State may adhere to this Treaty or associate itself with it according to the procedure to be determined by the Council of the African Common Market.

Any application by a non-member State for integration or association shall be examined by the Economic Committee of the Charter, and submitted to the Political Commission for approval.

Article 22. This treaty shall come into force one month after the deposit of the instruments of ratification by two of the Signatory States. This Treaty shall be applicable to other States one month after the deposit of their instruments of ratification or of admission.

The Treaty establishing the African Common Market was drawn up in Cairo, Egypt, on April 1, 1962, in 3 original copies in the Arabic, English, and French languages. The 3 original copies were to be deposited at the Permanent Secretariat of the Casablanca Charter, and a certified true copy delivered to each Contracting Party, and to any State subsequently agreeing to the Treaty. Included among the other economic agreements was: (1) agreement for establishment of the African Development Bank; (2) agreement on the establishment of a Council for African Economic Unity; Convention of Economic and Technical Cooperation. (United States Embassy, Cairo, May 15, 1962.)

INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

FIFTIETH STATUTORY MEETING HELD IN COPENHAGEN:

The fiftieth Statutory Meeting of the International Council for the Exploration of the Sea was held in Copenhagen, Denmark, September 28-October 10, 1962. The agenda for the opening meeting of the General Assembly included:

International (Contd.):

1. Report on Permanent Commission.

2. Report on International Commission for the Northwest Atlantic Fisheries.

3. Report on Intergovernmental Oceaographic Commission.

4. Report on European Inland Fisheries Advisory Commission.

5. Report on the Meeting on the Biology of Tuna and Related Species.

6. Report on International Whaling Commission.

A special meeting was devoted to problems in exploiting and regulating fisheries for shellfish. The program of the Council included meetings by the committees on plankton, gadoid fish, scombriform fish, herring, salmon and trout, sardines, and shellfish. There were also meetings by the committees on hydrography, statistics, and comparative fishing; and the committees on the Atlantic, Baltic-Belt Seas, distant Northern Seas, and near Northern Seas.

Australia

EXPORTER RECOMMENDS NEW METHOD OF SELLING LOBSTER TAILS TO UNITED STATES:

An orderly system for exporting Australian frozen spiny lobster tails to the United States is needed. This is the opinion of an Australian exporter who, in the spring of 1962, made an on-the-spot survey of the United States market. The exporter is the director of the largest privately-owned spiny lobster tail exporting firm in Australia.

The Australian exporter said, "A feeling of uncertainty prevails among the United States importers of Australian crays (lobster tails) especially on the East Coast. It is quite possible that large stocks which have had to be accumulated on account of irregular sailings to that coast will have to be sold at a loss because direct sales have been made from Australia to other than primary importers." He felt that sales to other than primary importers in the United States had caused a loss of good will, particularly on the East Coast which also obtained supplies from South Africa and South America. He suggested that a system similar to South Africa's, where a limited number of exporters sell to a limited number of importers, was ideal.

Australia is the third largest exporter of lobster tails to the United States. They shipped over 8,026,000 pounds of frozen lobster tails to the United States in 1961. (Fish Trades Review, Australia, June 1962.)

* * * * *

SHRIMP FISHERY STARTED IN WESTERN AUSTRALIA:

A bright future is predicted for Western Australia's shrimp, started on a commercial basis for the first time early this summer by a Whaling Company at Carnarvon. Some shrimp fishing had been attempted before, but there were no processing plants, freezers, or transports to handle the catch properly.

Some experts believe the Western Australia shrimp fishery potential is equal to Queensland where the industry employs 300 boats and is worth £2 million (US$4.5 million) a year in exports.

Until the extent of the shrimp grounds is full known, it would be impossible to say how much the shrimp fishery could be worth to Western Australia. All that can be said at present is that results have been encouraging. The Fremantle spiny lobster fleet, which is laid up every winter, is particularly interested.

The shrimp season in the northwest coincides with the slack period down south. If this season's shrimp trawling is successful, many of the Fremantle boats will be working next year instead of lying idle over the winter.

The whaling company has chartered one of Queensland's top shrimp fishing skipper and his trawler Dorothea W., for their pioneering effort.

The company has also engaged two Queensland crews to man their specially-designed shrimp trawlers Nor I and Nor II. The boats were built at Fremantle, to Queensland design, at a cost of £14,000 ($31,500) each.

The shrimp have received an enthusiastic reception in the Sydney fish trade because of

Australia (Contd.):

their uniformity in size and quality. (Australian Fish Trades Review, July 1962.)

* * * * *

NEW TYPE UNDERWATER VEHICLE FOR FISHERY RESEARCH:

A new type of underwater vehicle has been developed and built in South Australia. It could have many uses in commercial fishing and fish research. The vessel is called a "Towvane" and its designer is M. E. Lawrie, a commercial diver and slipway owner of Port Adelaide.

New type of underwater vehicle--"Towvane"-- being hauled aboard a vessel.

It can be towed behind any vessel over 35 feet long and needs no motive power of its own. Instructions are given to the operator by telephone from the towing vessel. This means that the "Towvane" rider need have no experience in underwater activity.

The new vehicle could be used to observe fish habits and effectiveness of fishing and trawling methods, survey the sea floor, search for and inspect underwater installations. Floodlights can be carried for use in murky waters.

Among the vehicle's advantages over "conventional" self-propelled submarines are its readiness for use at any time and the little maintenance or preparation needed.

It can be carried on deck and requires no special cradles or accommodation. A winch is used to launch or recover the "Towvane."

No special clothing is needed and once the vessel has been "trimmed" underwater the rider is free to observe and record his observations. In an underwater survey made recently, an engineer made on-the-spot notes on a tape-recorder carried on his lap.

There are no engines to operate, refuel, or maintain. And no turbulence from screws.

The "Towvane" has a range and speed limited only by that of the vessel towing it. Therefore it can be taken out to fishing grounds that would be inaccessible to other types of vessel.

The ability to send the expert comfortably below to make his own unworried observations is an advantage over secondhand reports from frogmen or other divers. Should the towing cable break the vessel will rise to the surface. The vehicle is of welded construction, built to vessel pressure standards.

It is of simple design and would lend itself to mass-production methods. It has been proved in many tests and open-sea trips. "Towvanes" could work in groups to sweep wide areas, being linked together by telephone.

The model being developed at present is 3 feet in diameter and stands about 6 feet high.

The specifications are: Depth limited only by hull thickness (probably suited to depths less than 1,000 feet; weight 1,600 pounds; positive bouyancy 30 pounds; plywood control vanes hydrostatically balanced; air supply; pressure release valve; transparent plastic window with 360 degree vision; interior and exterior accommodation for all types of ancillary equipment; telephone; interior hatch release.

* * * * *

WHALE OIL PRODUCTION DOWN IN 1962:

Australian baleen whale oil production during the 1962 season is expected to drop to 7,000 short tons, down 44 percent from production of 12,500 tons in 1961. Sperm whale oil production is expected to slightly exceed last year's output of 3,500 tons.

A sharp drop in the number of whales migrating from Antarctic waters for mating in warmer northern waters has caused a drastic decline in the abundance of humpback whales off the East Coast of Australia. Some observ-

Australia (Contd.):

ors blame the shortage on the lack of an effective international convention for limiting kills in other regions. The shore-based Tangalooma station at Moreton Island on the East Coast announced in early August that it had caught only 68 whales since the start of the whaling season June 18, 1962, and was suspending operations. The station on Norfolk Island on the East Coast also suspended operations, leaving only one station operating on the East Coast. The firm operating the station had been allocated a quota of 600 whales in the three months' season which opened last June 18. In the first three weeks of the season only 29 whales were caught. Last year the firm had a quota of 660 whales, but caught only 593. In recent years the annual value of production from Tangalooma has been about ŁA100,000 (US$225,000). In 1959/60 (the last year for which figures are available) it was worth ŁA96,384 ($217,000). Unofficial sources quote last year's production value at slightly over Ł75,000 ($169,000). This year's operating costs will far exceed the revenue.

The West Coast catch by shore-based whaling stations at Carnovan and Frenchman Bay also declined. But the decline was not as disastrous as on the East Coast, in part because of the availability of sperm whales. West Coast stations continued to operate.

The Australian Whaling industry has had a long history dating back to 1788. Commercially it has had many vicissitudes frequently due to overhunting. For just short of ten years the humpback whale which uses the coastal waters of eastern Australia for its annual migration from Antarctica to the tropics for breeding purposes has been hunted by chasers from the shore base at Tangalooma, on Moreton Island, Queensland. There was no difficulty in filling quotas of up to 660 whales in a season. But over the last few years there have been fewer whales to catch. This is not surprising when it is considered that a female humpback rarely produces more than one calf every two years, and that the species is hunted in other regions. (United States Consulate, Brisbane, August 10, 1962.)

Note: See Commercial Fisheries Review, Sept. 1962 p. 59, July 1961 p. 45.

Canada

NEW INSTITUTE OF OCEANOGRAPHY:

The construction of a new Canadian Institute of Oceanography at Bedford, Nova Scotia, was nearing completion about the middle of this year. The Institute, which is a part of the Marine Sciences Branch of the Canadian Department of Mines and Technical Surveys, will cost US$4.5 million when completed. A similar center is planned for Canada's west coast in about three years. The Bedford Institute, near Dartmouth, Nova Scotia, will have an office and laboratory building, docking facilities for ten ships, woodworking and electrical shops.

In addition to the newly-built oceanographic Institute, the Canadians have a long-range oceanographic shipbuilding program under way for survey and research work. As of May 1962, three ships were being designed or under construction. One of the ships, the Maxwell, was launched last year. The largest, the Hudson, will have a cruising range of 15,000 miles. The two additional vessels will be about 225 feet long and will replace obsolete ones now in use. (National Oceanographic Data Center Newsletter, May 31, 1962.)

Ceylon

FISHERIES DEVELOPMENT:

Landings and Imports, 1957-1960: Ceylon's total fishery landings in 1960 was 28.7 percent greater than in 1957. Imports and per capita consumption of fishery products also increased from 1957 through 1960. Three times as much fishery products are being imported as are produced locally. Data in Table 2 show that most of the imports con-

Table 1 - Ceylon's Landings, Imports, and Per Capita Consumption of Fishery Products, 1957-60

Item	1960	1959	1958	1957
	(Long Tons)			
Landings	49,001	43,832	40,032	38,065
Imports	134,479	122,783	130,796	106,523
Total Supply	183,480	166,615	170,828	144,588
	(Percentage)			
Percentage of Landings to Total Supply	26.7	26.3	23.4	26.3
	(Pounds)			
Annual Per Capita Consumption of Fishery Products in Ceylon	41.79	38.80	40.77	35.30

Source: Ceylon Department of Fisheries.

Ceylon (Contd.):

sist of dried or cured fish. A significant amount of canned and frozen fish also is imported.

Table 2 - Ceylon's Imports of Selected Fishery Products, 1960

Product	Quantity	Value	
	Long Tons	C. Rs. 1,000	US$1,000
Maldive fish . . .	3,095	11,245	2,364
Dried sprats . . .	5,278	18,771	3,947
Other dried fish .	593	1,238	260
Salt-dry fish . . .	30,848	59,308	12,470
Salt-wet fish (Jadi)	7,399	2,764	581
Dried shrimp . . .	1,229	2,985	628
Canned fish . . .	6,136	8,876	1,866
Frozen fish	61	139	29

Note: Values converted at 4.756 Ceylon rupees equal US$1.
Source: Ceylon Department of Fisheries.

Mechanization of Fishing Fleet: The increase in Ceylon's landings has been achieved by mechanizing part of the fishing fleet. In 1951, when the Government of Ceylon first decided to start mechanizing fishing boats, not one of Ceylon's 20,000 fishing craft had a motor. In 1952, total fishery landing amounted to only about 25,000 metric tons. In

Fig. 1 - A kattamaran near Jaffna on the north coast of Ceylon on the way to fishing grounds. This type of boat is made of five logs pegged and tied together, and equipped with centerboard.

1959, the Food and Agriculture Organization (FAO) sent a Finnish naval architect to Ceylon following a request by the Government of Ceylon for an expert capable of designing an ideal fishing boat for Ceylonese waters. (Editor's Note: In the early years of the mechanization program, the motorized fishing vessels built in Ceylon were based on designs first developed by FAO naval architects in India for Indian fishing vessels.) The Finnish expert designed a 28-foot inboard motor vessel that is now known throughout Ceylon as the "E-26." In the summer of 1962, there were about 600 of those boats in operation, many of them in the rich shallow waters of the 55-mile Palk Strait between Ceylon and India.

Fig. 2 - A Food and Agriculture Organization (FAO) expert installed two motors on two Ceylonese craft to demonstrate how the local boats could be motorized to advantage.

The "E-26" carries a crew of five and its average daily catch during the main fishing season between December and April is above a thousand pounds. This is far above the catch of any other Ceylonese vessel. The Finnish expert is now working on an improved version of the "E-26" which will be four feet longer and specially designed for fishing in the rougher northern waters.

Ceylon still has about 400 of the older model inboard motor boats which were built earlier in the mechanization program. They carry only 12 nets while the "E-26" can carry 50.

The Finnish naval architect also helped the Government start a program to mechanize Ceylon's traditional fishing craft by adding outboard motors. Ceylon's traditional fishing fleet consists of kattamarans (log rafts with a sail and a 2-man crew), teppams (a smaller version of the kattamaran), orus (outrigger sailing canoes), and vallams (dugouts with or without outriggers). All traditional craft can be beach-landed.

Ceylon (Contd.):

About 400 teppams and 200 kattamarans have been mechanized. The teppams require outboard motors of from 4-10 horsepower while the larger kattamarans need more powerful motors. A total of 200 vallams and orus have also been mechanized.

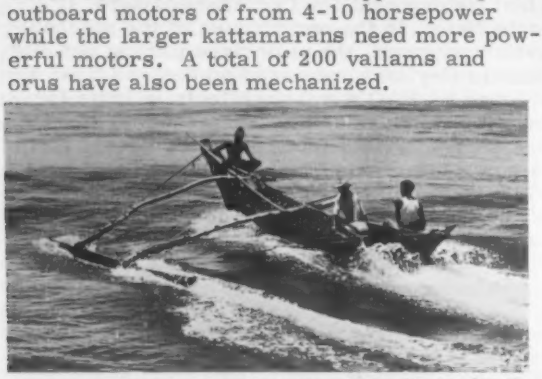


Fig. 3 - Speed trials of a small outrigger canoe fitted with a 10-hp. outboard motor on the south coast of Ceylon. FAO expert aided in introducing outboard motors for use on this type of boat.

The Finnish expert commented, "We figured putting outboards on these boats would increase their catch about five times. Actually it has been closer to ten." A non-mechanized kattamaran takes 10-12 pounds of fish per day. A 15-pound catch is considered good. For a mechanized kattamaran a catch of 120 pounds per day is normal. Improved tackle and nets have also helped increase the catch.

The mechanization program has been financed for the most part by Government loans.

Revised Plan for Fisheries Development: Investment in the fishing industry has fallen short of the goals announced in Ceylon's Ten Year Plan for the development of the fishing industry, which was published by the Government in 1959. The Plan had 1958/59 as its base period. In the summer of 1962, the Government of Ceylon published a "Memorandum on Development Projects of the Department of Fisheries for Which Foreign Aid and Assistance Is Sought." The "Memorandum" reviews the projects under the Ten Year Plan and makes recommendations for their revision. It states that the goal of self-sufficiency in fish production has been given less emphasis because of underinvestment in the fishing industry and increased per capita consumption. A shortage of harbors is cited as the main bottleneck hampering other projects under the Ten Year Plan.

According to the original Plan, 1,650 mechanized vessels were to be constructed during the period 1958/60-1959/61 and 650 more in the year 1961/62, bringing the total to 2,300. Actually, just under 700 vessels had been constructed by the end of 1958/61. If the present target of 500 to be built in 1961/62 is reached, the total will be little more than half that of the Ten Year Plan target. The "Memorandum" says that the goal was not met because of initial inexperience in this type of boat building; poor recoveries of loan installments; and slow construction of fishery harbors. The revised plan of the Department of Fisheries is to launch 500 vessels annually for the next three years. When more harbors are available, it is hoped to step up the rate of construction.

The problem of additional harbors is a vital one as it is estimated that present harbors will accommodate only 2,000 vessels. A survey carried out in 1960 by the International Engineering Consultants Association of Japan recommended the construction of 17 harbors at an estimated cost of about Rs.140 million ($29.4 million). The estimate will probably need revision. The "Memorandum" states that the Government of Japan has unofficially indicated that it would asssist in harbor construction. Even if decisions are made promptly, and plans are carried out, harbor construction time is estimated at from 2 to 3 years.

Because of limited harbor space for some time to come, the Department of Fisheries pointed out the necessity of continuing to mechanize the traditional craft which can easily be beached and now produce about 60 percent of the annual catch. The original program in the Ten Year Plan called for the mechanization of 1,700 traditional craft at a cost of Rs. 5.8 million ($1.2 million). A total of 5,170 craft were to be provided with modern fishing gear at a cost of Rs. 7.8 million ($1.6 million). The Department of Fisheries now proposes to recommend a modified plan under which marine engines and fishing gear will be given at subsidized rates to fishermen owning approved registered craft.

The new plan proposes to mechanize 500 out of 2,627 vallams, and at least 500 out of about 7,263 orus. Out of about 4,400 teppams and 2,200 larger kattamarans, it is proposed to mechanize at least 500 to 600.

Engine breakdowns on mechanized vessels have been substantial, due to the inexperience of fishermen. The "Memorandum" reports that engine suppliers will arrange training classes for mechanics and the Fisheries Training Center planned with Japanese aid

Ceylon (Contd.):

will give the necessary training to both fishermen and mechanics. A Food and Agriculture Organization (FAO) officer is reported to have started a detailed study of engines used by Ceylon's fishing vessels. A program on the use of improved gear and modern fishing techniques is being directed by another FAO expert with Japanese assistants and the staff of the Ceylon Department of Fisheries.

The Fisheries Department proposes to add a new trawler, for which Rs. 1.8 million ($0.4 million) has been provided, to the two it now operates. The "Memorandum" points out that existing facilities at the cold-storage plant built with Canadian aid at Mutwal must be expanded if additional trawlers are to be accommodated. The Department of Fisheries has outlined a plan for expanding the Mutwal Project and hopes the plan can be carried out with foreign aid.

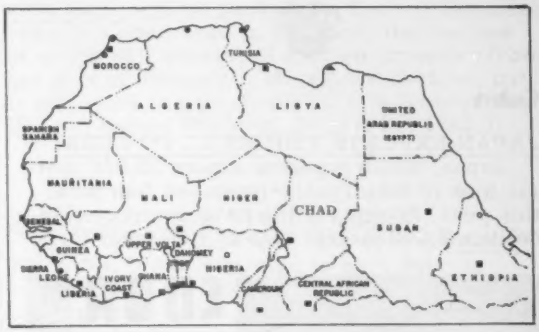
The Port Commission of Ceylon is building a harbor at Galle that will have 1,200 feet of alongside dock space for fishing vessels needing less than 20 feet of water. The harbor will cost Rs. 6.6 million (US$1.4 million) and is scheduled for completion in 1964. The Government of Ceylon has invited foreign investors to join with Ceylon in developing Galle harbor as a base for a tuna long-line fishing venture. It is hoped that foreign investors will develop the necessary shore facilities at Galle for processing fish. Roads and transport facilities for marketing the catch landed at Galle are also needed. Foreign investors in a joint fishing venture at Galle would be asked to furnish vessels, train the Ceylonese in modern fishing methods, and eventually transfer all interest in the venture to the Ceylonese. Ceylon has published an outline of the joint venture proposed for Galle harbor. Ceylon is also interested in receiving plans for other joint fishing ventures with foreign countries. (United States Embassy, Colombo, August 24, 1962; Food and Agriculture Organization, Rome, August 6, 1962.)

Note: See Commercial Fisheries Review, Aug. 1962 p. 58, Mar. 1962 p. 36, Sept. 1961 p. 68, June 1961 p. 55, May 1961 p. 44, Mar. 1961 p. 48

Chad

FISHING INDUSTRY OF CHAD:

The annual fresh-water catch from rivers and lakes in landlocked Chad amounts to about 100,000 metric tons. About 30 percent of the catch is consumed fresh close to the fishing areas. The other 70 percent is smoke-dried



and yields about 18,000 tons of dried fish. Some dried fish is exported to neighboring countries. Lake Chad is not fished by the Chadians because the people along its shore consider fishing unworthy work. (United States Embassy, Fort Lamy, June 18, 1962).

Note: See also under "Nigeria."

Colombia

REGULATIONS ESTABLISHED ON ISSUANCE OF SHRIMP FISHING PERMITS:

Regulations covering issuance of shrimp fishing permits to foreign flag shrimp vessel operators, prescribed in Decree 1656, were issued by the Colombian Government on June 28, 1962. The text of the Colombian Decree follows:

Article 1. Foreign flag vessels larger than 10 tons associated with local firms, and which intend to fish for shrimp, shall be permitted to dock at a Colombian port only after having obtained the required fishing permits as issued by the Ministry of Agriculture.

Article 2. The issuance of fishing permits by the Ministry of Agriculture shall be subject to prior approval by the Colombian Merchant Marine headquarters (Direccion de Marina Mercante Colombiana). All documents relating to each vessel, such as registration and tonnage certificates and navigation permits, must be submitted to the Colombian Merchant Marine.

Article 3. Article 7 of Decree 1409 of 1958, which permitted only Colombian flag vessels to fish for shrimp, is hereby rescinded.

Article 4. This decree shall be effective from the date of its publication in the Official Gazette.

Earlier in 1962, the Colombian Government placed a restriction on the issuance of licenses to fish for shrimp. These were limited to 100 on the Pacific Coast and 60 on the Atlantic

Colombia (Contd.):

Coast. About 80 licensed operators were fishing shrimp on the Pacific Coast as of February 1962 and the prospects were then dim for additional licenses to be granted for that region due to an excessive supply of shrimp in local cold-storage centers. No operators were holding licenses for shrimp fishing on the Atlantic Coast at that time. (United States Embassy, Bogota, report of July 27, 1962.)
Note: See Commercial Fisheries Review, April 1962 p. 45.

Cuba

JAPAN EXPORTS FISH MEAL TO CUBA:

Japan, which hopes to export 20,000 metric tons of factoryship-produced fish meal this year, is reported to have contracted to deliver 2,000 metric tons of fish meal to

Cuba in exchange for Cuban sugar. Half of the contracted amount, or 1,000 tons, is said to have already been shipped. Export price of the fish meal sold to Cuba is approximately US$147 a metric ton, f.o.b. Japan. (Suisan Keizai Shimbun, August 15, 1962.)

Dahomey

FAO FISHERY OFFICER ASSIGNED TO DAHOMEY:

The assignment of a Fishery Officer (a native of Belgium) to Dahomey (formerly a part of French West Africa) was announced by the Food and Agriculture Organization (FAO) on September 4, 1962. He will head a project being sponsored jointly by FAO and the United Nations' Expanded Program of Technical Assistance.

The newly-appointed Fishery Officer was scheduled to arrive in Dahomey about August 29. He will remain there for one year, assisting the Government in reorganizing its fisheries. One of his principal tasks will be to draw up a plan for the improvement of both lagoon and sea fishing, including the resettlement of lagoon fishermen on the country's coast. The Fishery Officer assigned to Dahomey had made a preliminary survey of Dahomey's fisheries for FAO in April 1962.

Denmark

FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, MAY 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first five months of this year were 24.4 percent greater than in the same period of 1961, mainly because of an increase of 156.5 percent in exports of herring fillets.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, May 1962 1/

Product	May		Jan.-May	
	1962	1961	1962	1961
	(1,000 Lbs.)			
Fillets and Blocks:				
Cod and related species.	3,782	2,947	17,067	16,734
Flounder and sole	2,299	2,356	9,288	8,193
Herring	1,762	440	9,430	3,676
Other	118	88	379	477
Total	7,961	5,831	36,164	29,080
	(Short Tons)			
Industrial Products:				
Fish meal, fish solubles, and similar products	6,027	2,215	23,719	12,977

1/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.

Hvide Sande, fishing port on west coast of Jutland, Denmark.

Denmark (Contd.):

Exports of cod and related species increased 2.0 percent and flounder and sole fillets were up 13.4 percent. During the first five months this year exports to the United States of fresh and frozen fillets and blocks of almost 7.3 million pounds (mostly cod and related species) were up 25.9 percent from the exports of about 5.8 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during May 1962 were 36.5 percent greater than in the same month in 1961. Of the total exports, almost 2.3 million pounds (mostly cod and related species) were shipped to the United States in May.

Denmark's exports of fish meal, fish solubles, and similar products in January-May 1962 were 82.8 percent greater than in the same five months a year earlier.

During May 1962, Denmark exported almost 3 times the meal, fish solubles, and similar products shipped out in the same month of 1961. The principal buyers were West Germany, Finland, The Netherlands, and the United Kingdom.

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FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JUNE 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first six months of this year were 16.7 percent greater than in the same period of 1961, mainly because of an increase of 148.4 percent in exports of herring fillets. Exports of flounder and sole fillets increased 11.9 percent, but exports of cod and related species declined 5.7 percent. During the first six months of this year exports to the United States of fresh and frozen fillets and blocks of about 8.4 million pounds (mostly cod and related species) were up 9.1 percent from the exports of about 7.7 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during June 1962 were 17.6 percent below exports in the same month in 1961. Of the total exports, about 1.2 million pounds (mostly cod and related species) were shipped to the United States in June.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, June 1962 1/

Product	June		Jan.-June	
	1962	1961	1962	1961
	(1,000 Lbs.)			
Fillets and Blocks:				
Cod and related species	2,245	3,740	19,312	20,474
Flounder and sole	2,159	2,039	11,447	10,232
Herring	904	485	10,334	4,161
Other	40	223	419	700
Total	5,348	6,487	41,512	35,567
	(Short Tons)			
Industrial Products:				
Fish meal, fish solubles, and similar products	8,191	9,070	31,910	22,047

1/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.

Denmark's exports of fish meal, fish solubles, and similar products in January-June 1962 were 44.7 percent greater than in the same six months a year earlier.

During June 1962, Denmark's exports of fish meal, fish solubles, and similar products were 9.7 percent below the amount shipped out in the same month of 1961. The principal buyers were the United Kingdom and West Germany.

Ecuador

JAPANESE FISHING VESSEL BASED IN ECUADOR TO FISH TUNA AND SHRIMP:

According to a Japanese report, the Japanese fishing vessel Daishin Maru No. 7 is scheduled to be dispatched sometime this year to Ecuador where it will engage in shrimp and skipjack tuna fishing. Reportedly, the Daishin Maru will be part of the fleet of Japanese vessels to be based in Ecuador, the nucleus of which will consist of medium trawlers from the port of Shiogama, Miyagi Prefecture, but it will work independently of this trawler fleet. (Suisan Keizai Shimbun, August 22, 1962.)

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JAPANESE TUNA VESSEL SEIZED:

The 480-ton Japanese tuna vessel Seisho Maru No. 5 was reported to have been arrested by an Ecuadorean Navy patrol vessel on August 19, 1962, while fishing off Ecuador. The Seisho Maru reportedly was being escorted to San Cristobal in the Galapagos Islands for possible trial on suspicion of having violated Ecuadorean territorial waters. (Suisan Tsushin, August 24, 1962.)

El Salvador

IMPORT DUTY ON UNITED STATES CANNED SALMON AND CANNED MACKEREL UNCHANGED:

The preferential import duty on United States canned salmon and canned mackerel approved by the Legislature of El Salvador on August 13, 1962, is: $5 per 100 kilograms (about 2.27 U. S. cents a pound), plus 6 percent ad valorem, according to a San Salvador newspaper. The new rate of duty is the same as that provided by the 1937 Trade Treaty between the United States and El Salvador which was terminated August 9, 1962. (United States Embassy, San Salvador, August 17, 1962.)

Ethiopia

RED SEA FISHERY RESOURCES NOT FULLY USED:

Ethiopia has not yet developed her rich fishing grounds in the Red Sea. Possibilities exist for starting local industry to process

Ethiopia (Contd.):

tuna, sardines, snapper, shrimp, and spiny lobsters. During the 12 month period ending September 1961, total landings of fish and shellfish in Ethiopia amounted to only 11,000 metric tons. Sardines and anchovies made up over 90 percent of the catch and were used mainly for dried fish and fish meal. (United States Consulate, Asmara, June 26, 1962.)

France

FRENCH FISHERMEN PROTEST IMPORTS OF MOROCCAN FROZEN SARDINES:

An oversupply of sardines in French ports in the summer of 1962 caused French fishermen to protest against imports of frozen sardines from Morocco. In one port (Breton), demonstrators destroyed 40 tons of a 150-ton cargo of frozen sardines brought to France aboard a Moroccan ship.

Therefore, shipments of frozen sardines to France have been suspended by Morocco following the violent protests of Breton fishermen. An unusually abundant sardine catch off the Breton Coast is reported to have glutted the French market and to have caused prices to collapse. Morocco has an arrangement of duty-free quotas for many products exported to France, including all types of sardine products. (United States Embassy, Rabat, July 27, and August 10, 1962.)

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JAPANESE FIRMS EXPORT FROZEN TUNA TO FRANCE:

Two Japanese firms in July 1962 concluded contracts to export a total of 418 metric tons of frozen tuna (consisting of yellowfin, albacore, and bluefin) to France. While these quantities are small, they are the first shipment of frozen tuna destined for France this year, and it is expected that frozen tuna exports to that country will reach close to 3,000 metric tons by the end of this year.

Other Japanese firms are also negotiating with French firms to export frozen tuna to France, which reportedly is interested in increasing imports of that product for canning purposes. (Suisan Keizai Shimbun, July 22, 1962.)

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FIRST INTERNATIONAL "FISH FAIR" HELD:

France held its first "Biennale Internationale des Peches" (International Fisheries Biennial), May 25-June 3, 1962, at the Port of Lorient. The event took place in a covered structure called the "Paladium" measuring about 33,000 square feet, as well as along the quays of the sea fishing port which is located at the northern end of the Bay of Biscay.

The event was sponsored by the Lorient Chamber of Commerce as a means of stimulating the French fishing industry, to increase the consumption of fish in France, and to alert the industry to the increased competition it can expect from other nations in the Common Market group. France's per capita consumption of fishery products ranges from 26 to 28 pounds and is considered below that of other European nations.

The "Fish Fair" was rated the most important ever organized by the French fishing industry. Its aim was to group together all the activities of the fishing and related industries, from fishing boats and equipment to the meal and oil industries, packing industries, and distribution channels. The 600 stands inside the covered structure were occupied by some 152 participants. All were French except eight. Among the 8 foreign firms, there were 2 from Sweden, 2 from Holland, 1 from Denmark, 1 from Spain, and 1 from Belgium.

The "Fish Fair" was reported not to have attracted as many general visitors as some other commercial fairs held in the larger French cities, but it was well attended by people representing France's fishing industry. Many contracts and good business transactions were made, and the participants were reported to have been satisfied with the results.

It was reported, however, that the French press carried strong criticism about the fact that outside of fishing equipment, which was well presented, very little was shown relating to industries involved in the distribution of fish. The lack of such representation was said to reflect the present situation in France where the canning, freezing or icing, and distribution of fish were said to be poorly organized. According to the French press, the Biennale at least helped draw attention to that problem.

A number of various conferences and lectures were programmed for the "Fish Fair." May 28 was "Foreign Commerce Day," May

France (Contd.):

30"Consumers' Day," June 1, "Fishing Fleet Day," and June 2 "Fish Dealers' Day." At the "Foreign Commerce Day," the Canadian Vice-Minister of Fisheries, the Assistant Director of the Moroccan Fisheries Office, the Director of Industrialization in Senegal, and the Director of a fishery magazine in Athens, Greece, all spoke of fishing practices and techniques in their own countries. The Directeur General of the French Centre National du Commerce Exterieur, who presided on "Foreign Commerce Day," emphasized the necessity to help underdeveloped countries, technically and financially, to organize their own fishing. Subsequent incidents involving the deliberate destruction of Moroccan-caught sardines landed at French ports were considered significant.

The consumption of fish in France is expected to increase in the near future, and it is believed that frozen fishery products will take an important part of the market. If not soon produced in France, increasing quantities of frozen fishery products could conceivably be imported from foreign countries. A French press article stated that "no display of frozen fish products was shown at this first biennial since so very few foreign firms participated. No American firm participated but it is hoped that the next biennial will arouse more interest on the part of American and other foreign firms." (United States Embassy, Paris, August 18, 1962.)

Gabon

STATUS OF FISHERIES, 1961:

The fishing industry of Gabon is relatively small. In 1961, the five local fishing companies produced 1,200 metric tons of fish valued at US$530,000. Although the fishery resources off the Gabonese coast are reported to be large, substantial imports of fish are necessary to meet local needs. (United States Embassy, Libreville, August 1, 1962.)

Ghana

SOVIETS DELIVER FISHING VESSEL TO GHANAIAN FIRM:

A Soviet-built fishing vessel arrived in Tema, Ghana, late in August 1962 for delivery to a Ghanaian firm. Newspapers in Ghana reported that the ship cost ŁG30,000 ($84,000), has crew facilities for 12, and is capable of remaining at sea for 9 days. A group of Soviet technicians accompanied the ship. They will train Ghanaian crewmen in fishing methods, and is believed that the training will be mainly in herring fishery techniques.

Russian fishing crews and vessels have been hired in the past on contract by the Ghanaian firm that received the new vessel. The firm acts as the agent for Prodintorg of Moscow and handles provisions and goods for the Russian organization. (United States Embassy, Accra, August 28, 1962.)

Note: See Commercial Fisheries Review, Nov. 1961 p. 48.

Republic of Honduras

SHRIMP EXPORTS TO UNITED STATES DECLINE:

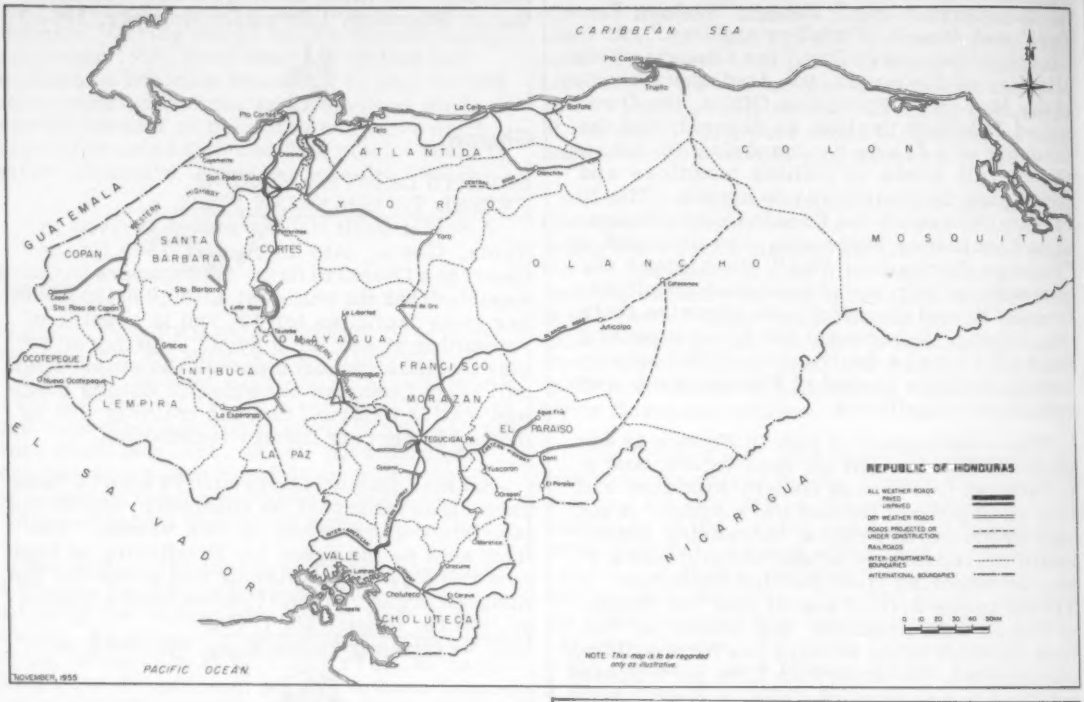
Total 1961 fishery products exports by the Republic of Hondurus amounted to 125 metric tons, valued at 235,814 lempiras (US$117,908). All but about 10 percent of the total was shipped to the United States--principally frozen shrimp and frozen spiny lobster tails. The remainder went to El Salvador.

Total Fishery Products Exports by Republic of Hondurus, 1961

Product	To United States			To El Salvador		
	Quantity	Value		Quantity	Value	
	Metric Tons	Lempiras	US$	Metric Tons	Lempiras	US$
Fish, including live fish, fish meat & edible fish eggs, fresh, refrigerated, or frozen (includes aquarium fish)	-	-	-	1/	200	100
Fish, including fish meat & edible fish eggs, dried, salted, smoked, or cured, but not otherwise prepared	-	-	-	11	11,575	5,788
Crustaceans & mollusks, fresh, refrigerated, frozen, salted, dried, smoked, cured, or cooked (except shrimp)	17	29,891	14,946	1/	40	20
Shrimp, fresh, refrigerated, frozen, salted, dried, smoked, cured, or cooked	97	194,108	97,054	-	-	-
Total	114	223,999	112,000	11	11,815	5,908

1/Less than 1 metric ton.
Notes: (1) Values converted at rate of 2.00 lempiras equal US$1.
(2) Fishery products were exported only to the United States and El Salvador.

Republic of Hondurus (Contd.):



The 1961 exports of frozen shrimp from that country to the United States were below the previous year, and were the lowest since 1958 when they were at a record high. Shrimp landings in Hondurus during 1961 totaled only a little more than 200,000 pounds, practically all of which was shipped to the United States.

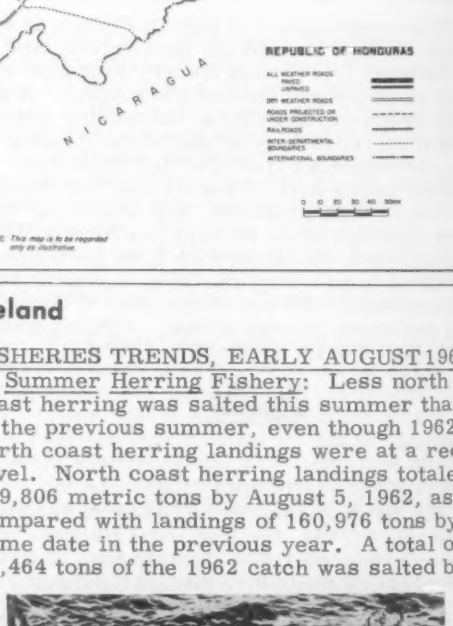
United States frozen shrimp imports from Hondurus during the past several years were: 362,000 pounds in 1960; 271,000 pounds in 1959; and a high of 836,000 pounds in 1958 (when they were first shown separately from other countries). In 1958, the Hondurus shrimp landings amounted to nearly one million pounds, with the bulk coming to the United States. The sharp downward trend in shrimp fishing activity in Hondurus seemed to stem from certain provisions in the Fishing Law enacted during 1959, which apparently discouraged foreign investment in the Hondurus shrimp fishery. (Comercio Exterior, 1961.)

Note: See Commercial Fisheries Review, July 1962 p. 65.

Iceland

FISHERIES TRENDS, EARLY AUGUST 1962:

Summer Herring Fishery: Less north coast herring was salted this summer than in the previous summer, even though 1962 north coast herring landings were at a record level. North coast herring landings totaled 189,806 metric tons by August 5, 1962, as compared with landings of 160,976 tons by the same date in the previous year. A total of 34,464 tons of the 1962 catch was salted by



Brailing a good catch of herring.

Iceland (Contd.):

early August, while 46,286 tons of the north coast herring catch was salted by the same time last year. Most of the remainder of the 1962 catch was processed into fish meal and oil.

Although hampered at times by bad weather, the herring fishery was rated very good. According to the Icelandic weekly herring report of August 19, 1962, a total of 226,195 metric tons of herring had been caught to that date compared with 200,263 tons by the same time the previous year.

Herring Salting: The amount of herring salted by August 1962--43,736 tons--was the greatest since 1939 except for the summer of 1961 when it was boosted up to 48,151 tons. But herring salting was stopped by August 19 as summer herring contracts totaling 312,000 barrels had been filled. Those contracts consisted of: 128,000 barrels to Sweden; 80,000 barrels to the U.S.S.R.; 55,000 barrels to Finland; 12,300 barrels to the United States; 8,700 barrels to West Germany; 6,700 barrels to Norway; 4,500 barrels to Denmark; and about 17,000 barrels for local use, including canning.

Herring salting was resumed after the announcement on August 8, 1962, that contracts had been signed with the Soviet Union and Israel for salted north coast herring. The announcement temporarily ended the annual speculation and unrest over the Soviet herring contract. The contract with the Soviet Union was for 80,000 barrels of salted north coast herring at a "somewhat higher price than last year." Last year, contracts with the Soviet Union for both north and south coast herring amounted to 152,000 barrels. The new contract with Israel calls for 6,000 barrels of specially-cured herring. Work had not yet begun on the Israeli contract. There were some prospects of additional contracts with Sweden or Finland. North coast contracts for salted herring total 320,000 barrels.

The Herring Fisheries Committee had not yet signed any contracts for south coast salted herring. There was an air of pessimism over their prospects. Considerable discussion had taken place over the future of salted herring markets in view of declining consumption. Even the Conservative press attacked the State Herring Board's sales system and called for a reorganization, as well as an intensive search for new markets.

Fishery Trade with Soviet Bloc: In response to Icelandic newspaper editorials which emphasized the disadvantages of trade with the Soviet Bloc nations, the Icelandic Freezing Plants Corporation stated that trade with the Bloc has been beneficial to the freezing plants, as well as to Iceland's fishing industry as a whole. The statement generated a new wave of democratic press protests against such trade. The main theme of the protests was that because fish products are sold on a barter basis to the Bloc countries, the Icelandic consumer is forced to buy inferior goods at high prices. The press also pointed out that it is extremely dangerous for Iceland to be in a position where Icelandic trade is subject to the whims of Soviet trade decisions, which are often based on political considerations.

Visit of Russian Vessel: A large 3,250-ton Russian trawler visited Reykjavik in connection with a joint research project on size of mesh. Experts who visited the vessel were impressed with its freezing and reduction plant.

Scandinavian Fisheries Conference: Iceland sent a strong delegation of nine representatives to the Scandinavian Fisheries Conference in Trondheim, Norway, in the middle of August. It is understood that much of the Conference discussion was about new fisheries conditions being created by the Common Market (European Economic Community). The Icelandic Minister of Fisheries discussed in a press interview the resolution of the Scandinavian Fisheries Ministers Conference. The essence of the resolution was that the Scandinavian countries should have a hand in formulating European Economic Community fisheries policy, because the Scandinavian countries would, on joining, account for more than half of the fish production of the expanded Common Market. (United States Embassy, Reykjavik, August 10 and 24, 1962.)

Japan

FROZEN TUNA EXPORTS TO UNITED STATES AND EUROPE, APRIL-JULY 1962:

The Japan Frozen Foods Exporters Association has compiled data showing frozen tuna exports to the United States and Europe for April-July 1962. (Suisan Tsushin, August 9, 1962.)

Japan (Contd.):

Table 1 - Japanese Frozen Tuna Exports to United States, April-July 1962

Product and Source	1962	1961	1960
	(Short Tons)		
Albacore:			
Japan proper:			
Round	2,848	3,741	4,061
Loin	362	415	285
Transshipments	2,445	1,715	561
Total	5,655	5,871	4,907
Yellowfin:			
Japan proper:			
Gilled and Gutted:			
With head	13,990	10,481	13,031
Without head	251	-	63
Loin	3,447	942	970
Fillet	2,269	315	68
Transshipments	6,156	7,787	4,099
Total	26,113	19,525	18,231
Big-eyed:			
Japan proper	1,490	137	62
Skipjack:			
Japan proper	246	-	71
Bluefin:			
Japan proper	213	-	220
Total exports from Japan proper	25,116	16,031	18,831
Total transshipments	8,601	9,502	4,660
Combined total exports	33,717	25,533	23,491

Table 2 - Japanese Frozen Tuna Exports to Europe & Africa, April-July 1962

Destination	1962	1961	1960
	(Metric Tons)		
Italy	9,345	7,777	8,734
Yugoslavia	3,034	3,506	4,804
France	418	-	4,160
Ghana	393	-	-
Czechoslovakia	192	656	-
Other countries	5	1,029	528
Total	13,387	12,968	18,226

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VALUE OF FROZEN AND CANNED TUNA EXPORTS IN FIRST HALF OF 1962:

Japan's exports of frozen tuna to the United States in the first 6 months of 1962 were up 72.1 percent in value as compared with the same period in 1961. For the same period the export value of canned tuna dropped 17.6 percent.

The United States took 62.6 percent of Japan's total frozen tuna exports during the first half of 1962 as compared with 50.7 percent in the same period of 1961. The United States ratio of Japan's total canned tuna exports was 69.8 percent as against the same period in 1961 when it was 65.7 percent.

The marked improvement in Japan's balance of trade during the first half of 1962 was expected to remain good until the close of the year, with indications that exports to the United States of most major commodities would continue good for the remainder of 1962. (United States Embassy, Tokyo, August 24, 1962.)

Value of Japan's Exports of Selected Fishery Products, January-June 1961-62

Product	Jan.-June 1962			Jan.-June 1961		
	U.S.	Total	U.S. Ratio	U.S.	Total	U.S. Ratio
	(In US$1,000)		%	(In US$1,000)		%
Tuna, frozen	16,138	25,760	62.6	9,375	18,485	50.7
Tuna, canned	6,932	9,936	69.8	8,410	12,797	65.7
Pearls, worked	10,423	22,192	47.0	8,065	17,063	47.3

Note: Exports are valued f.o.b. Japan.
Source: Customs Bureau, Japanese Ministry of Finance.

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NINTH SALE OF CANNED TUNA IN BRINE FOR EXPORT TO U. S.:

The ninth sale of canned tuna in brine for export to the United States was approved by the Canned Tuna Sales Standing Committee of the Japan Canned Foods Exporters Association at the August 21, 1962, meeting of the Association. The Committee approved the sale of 200,000 cases (48 No. ½, 7-oz., cans) of canned tuna in brine, consisting of 135,000 cases of white meat tuna and 65,000 cases of light meat tuna. Export prices per case remain unchanged: white meat US$10.40, light meat US$7.80, f.o.b. Japan.

Japanese exports of canned tuna in brine to the United States up to and including the ninth sale totaled 1,943,000 cases, consisting of 1,103,000 cases of white meat tuna and 840,000 cases of light meat tuna. Reportedly, there now remains only 257,000 cases of canned tuna in brine yet to be exported to the United States before the export quota established by the Japan Canned Foods Exporters Association is filled. (Suisan Tsushin, August 22, 1962.)

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EXPANSION OF FROZEN TUNA EXPORTS TO UNITED STATES UNDER STUDY:

The Japanese Export Frozen Tuna Producers Association has undertaken an investigation for the purpose of expanding exports of frozen tuna to the United States from Japan proper. According to the Association, exports of frozen tuna to the United States from Japan proper for April, May, and June 1962 were exceedingly good, and, as of July 15, a total of approximately 20,000 short tons of the 35,000-ton export quota for yellowfin tuna had been used. This left only 15,000 short tons of yellowfin available for export for the remainder of the fiscal year (to March

Japan (Contd.):

1963) and the Association feels this amount to be inadequate.

One element in the Producers Association feels that the separate quota of 30,000 short tons of albacore for export to the United States from Japan proper should be combined under one over-all yellowfin-albacore export quota. Their reasoning at the present time is that it appears the albacore export quota will not be completely utilized. As of July 15, albacore exports to the United States reportedly totaled about 4,000 short tons.

This move, if it develops, is expected to be opposed strongly by those groups that hold allocations of frozen albacore export quotas, for their allocations until now have been based on past performance records, and they do not wish to see this system replaced with one which completely ignores their hard-won export quotas.

Exports of frozen tuna to the United States had begun to decline in July and this development was expected to delay settlement of the yellowfin quota expansion issue. However, the need for increasing the yellowfin export quota is acknowledged by the Association, (Suisan Keizai Shimbun, July 19, 1962.)

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EX-VESSEL PRICE FOR FROZEN YELLOWFIN TUNA DROPS:

After July 1962, the Japanese export price of frozen tuna for shipment to the United States declined. Because of this, the Japanese landed or ex-vessel price of frozen tuna at Japanese ports dropped markedly. For instance, the ex-vessel price for yellowfin of 20-100 pounds dropped to ¥110 per kilo (US$277.20 a short ton) on August 18 at Yaizu. Later it dropped to ¥108 ($272.20 a short ton), which is said to be the lowest for this year and some ¥30 a kilo ($75 a short ton) lower than at the time of the best market. The reason for the drop is attributed to increased arrivals of frozen tuna in August, and particularly to the cautious commitment and sales policy of the frozen tuna exporting firms. (Japanese periodical, August 21, 1962.)

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TUNA EX-VESSEL PRICES AT TOKYO:

The following ex-vessel prices were paid on August 22, 1962, for 393 metric tons of tuna and spearfish landed in Tokyo by two Japanese long-line vessels. (Suisan Keizai Shimbun, August 24, 1962.)

Tokyo Ex-Vessel Tuna Prices, August 22, 1962

Product	Price	
	Yen/Kg.	US$/Short Ton
Yellowfin (gilled & gutted):		
20-80 pounds	102-110	257-277
Over 80 pounds	90-91	227-229
Albacore	140	353
Fillets:		
Yellowfin	102-111	257-280
Big-eyed	105-106	264-267

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COSTS FOR EXPORTING FROZEN TUNA TO EUROPE FROM JAPAN PROPER:

The European tuna market is reported to have become particularly attractive to Japanese tuna exporters in view of the price decline in the United States tuna market. According to the Japanese periodical Suisan Tsushin of July 25, 1962, the present price of frozen yellowfin tuna (dressed with tail) exported to Europe from Japan proper is about US$380 a metric ton at port of destination. Deducting 3 percent for broker's commission and $55-60 a ton for transportation cost (unscheduled freighter rates[1/]) from this figure leaves a balance of $310-315, which would be the Japan f.o.b. price per metric ton. Further if allowances of $20 per metric ton for handling costs up to time of shipment and a maximum of 10-percent loss for processing (i.e., deheaded, gilled and gutted frozen tuna landed by clippers) are made, the new adjusted price amounts to $232-239 a short ton. This adjusted price is higher than the present Tokyo ex-vessel price of $222 a short ton for gilled and gutted frozen yellowfin, which allows a good margin of profit for Japanese exporters exporting frozen yellowfin tuna to Europe from Japan proper.

The Suisan Tsushin adds that frozen skijack tuna were recently exported to Italy from Japan proper on a trial basis. Reportedly, they were exported for $310 per metric ton, c.i.f. Italy. (Suisan Tsushin, August 25, 1962.)

1/Scheduled freighter rates are quoted at $77 a metric ton by the Suisan Tsushin.

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ATLANTIC OCEAN TUNA FISHERY AND PRICES FOR ATLANTIC FROZEN TUNA, AUGUST 1962:

About one-third of the nearly 80 Japanese long-line tuna vessels operating in the Atlantic Ocean were reported to be fishing in

Japan (Contd.):

the Caribbean Sea in early August 1962. Late in July, a number of the vessels found a new fishing ground for albacore around Puerto Rico. Catch of albacore (vessels of 350-500 gross tons averaged 7 metric tons per day in early July) was reported to have declined in August to about 3 metric tons per day. The main fishing grounds had shifted southward to the offshore waters near the Guianas.

Elsewhere in the Atlantic Ocean, Japanese vessels operating off the West African coast are reported to be averaging 3-4 metric tons of fish per vessel per day. Catch was reported to consist of 60 percent yellowfin and 40 percent bigeyed. The yellowfin tuna catch was better than last year off West Africa.

Export prices of Japanese Atlantic Ocean frozen tuna for shipment to the United States (Dakar delivery) in early August were reported: albacore US$340 a short ton; yellowfin $290 a ton; big-eyed $230 a ton.

Prices of frozen tuna exported to Italy, at Italian ports of destination, in early August were reported: albacore $450 a metric ton; yellowfin $380 a ton; big-eyed $350 a ton. These prices include brokers' commission. (Suisan Tsushin, August 23, 1962.)

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SPECIAL COMMITTEE FORMED TO STUDY TUNA PROBLEMS:

Japanese tuna industry members held an informal conference at Tokyo on August 24, 1962, to consolidate industry's views concerning the forthcoming Japan-United States tuna meeting scheduled to be held at Tokyo, beginning October 9. Upon the recommendation of the President of the Japan Fisheries Society, the group decided to establish a special committee within the Japan Fisheries Society to study problems relative to the tuna industry in view of growing international tuna problems. The committee's first assignment is to prepare a paper for submission to the Japanese Government summarizing industry's views concerning the October tuna meeting with the United States.

The following organizations were represented at this meeting: Japan Fisheries Society, Canned Tuna Exporters Association, Canned Foods Exporters Association, Tokyo Canned Tuna Sales Company, Frozen Foods Exporters Association, Export Frozen Tuna Producers Association, Export Frozen Tuna Sales Company, Federation of Tuna Cooperative Associations, and the National Federation of Fishery Cooperatives. (Minato Shimbun, August 25, 1962.)

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TUNA FISH-FINDER DEVELOPED:

A Japanese fish detector manufacturer with offices in Numazu, Shizuoka Prefecture, is reported to have developed a fish detector (called "Televi-graph De Luxe") exclusively for tuna detection. The detector is said to detect albacore tuna to a depth of 985 feet, clearly reproduce images of individual fish, and accurately record plankton masses and boundaries of water masses. Its vertical depth range is said to exceed 9,800 feet. (Suisan Keizai Shimbun, August 15, 1962.)

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OVERSEAS TUNA BASES TRYING TO ACQUIRE MORE VESSELS:

As the tuna catch quota has been increased by Japanese authorities by 20 percent in mothership-type operations and by 50 percent at the bases in American Samoa and Espirito Santo, respectively, additional vessels are required at all those bases. Further, the port of Penang in Malaya has acquired a transshipment quota of 6,000 tons of frozen tuna, and plans are stepped up in establishing new bases at Fiji, Tahiti, New Caledonia, and Madagascar.

All of the fishing companies concerned in those operations and projects are trying to acquire additional vessels of up to 180 gross tons in size. It is reported that representatives of the firms concerned are seen at all principal Japanese tuna ports. (Japanese periodical, August 21, 1962.)

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REVISION OF TUNA VESSEL FISHING REGULATIONS PLANNED:

The Japanese Fisheries Agency is reported to have revealed its intention to revise existing regulations governing operation of medium- and distant-water tuna vessels and portable-vessel-carrying tuna motherships, based on the request submitted by the National Federation of Japan Tuna Fisheries Cooperative Associations. Reportedly, the Agency intends to make the following changes in the existing regulations:

Japan (Contd.):

1. Licensed tuna fishing vessels will be permitted to transfer their catches at sea, with certain exceptions.

2. Fishing vessels operating independently will be permitted to unload their catches at transshipment bases in the Pacific Ocean for shipment to Japan proper. However, they will not be allowed to transship their catches for export purposes.

3. Restrictions on types of fishing vessels authorized to land catches at overseas bases or authorized to fish for motherships will be removed.

4. Conditions and restrictions currently governing the licensing of tuna fishing vessels, such as retiring a vessel before constructing a new vessel, will be removed, with certain exceptions. (Present regulations require that more than 50 gross tons be put up as replacement tonnage when constructing a new vessel.)

5. Regulations will be revised to strengthen control over unlicensed fishing vessels.

6. In the assignment of vessels to overseas fishing bases, the provision in the regulations which grants priority to newly-licensed fishing vessels will be deleted. (Suisan Keizai Shimbun, August 14, 1962.)

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TUNA LONG-LINER FLEET TRENDS:

Data compiled by the Japan Export Frozen Tuna Producers Association show that, as of July 1, 1962, the number of Japanese tuna distant-water long-liners totaled 445 vessels.

Composition of Japanese Distant-Water Tuna Long-Liner Fleet

Size Range (Gross Tons)	No. Vessels	Total Gross Tonnage
170-250	100	23,605
250-350	169	51,701
350-450	88	34,099
450-550	50	24,292
550-750	16	10,415
750-1,000	6	5,271
Over 1,000	16	21,032
Total	445	170,415

The data also revealed that between January-June 1962, a total of 49 new tuna long-liners (totaling 16,759 gross tons) were constructed. In 1961, 116 long-liners (totaling 38,820 gross tons) were constructed; in 1960, 78 vessels (totaling 32,274 gross tons) were built.

Examination of data for January 1960-June 1962 shows that the majority of the long-liners constructed during that $2\frac{1}{2}$-year period were under 250 tons gross, followed by vessels in the 250-350 ton category. Also, 72 percent of the vessels under 250 tons gross and 60 percent of those in the 250-350 ton category were constructed after 1960. In contrast, only 3 vessels in the 550-1,000 ton class have been constructed since January 1960. (Suisan Tsushin, August 17, 1962.)

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STERN TRAWLER TO FISH FOR COD IN NORTHWEST ATLANTIC:

A license permitting temporary trawling operations in the Northwest Atlantic by the stern trawler Aoi Maru No. 2 (1,138 gross tons) was issued by the Japanese Fisheries Agency to one of the three Japanese fishing firms which applied for such permits during early August this year. The vessel was scheduled to leave Nagasaki for fishing in the vicinity of Newfoundland, using St. Pierre (a French free port) as its base of operations.

The fishing firm that was granted the permit is a subsidiary of a Japanese marketing firm, which has shown considerable interest in supplying cod for the St. Pierre fish stick processing industry, and also exporting cod to the United States and Europe.

It was reported that the plan was stimulated by a sharp rise in the consumption of cod in the United States and Latin American countries, and was not to be regarded as a substitute for any failure in Japanese trawling operations off Africa's Atlantic Coast. (Japanese periodical, July 24-30, 1962.)

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TRAWLING IN NORTHWEST ATLANTIC EXPECTED TO START EARLY IN OCTOBER 1962:

The Japanese trawler Aoi Maru (1,134 gross tons) was expected to start fishing in the Northwest Atlantic off the coast of Greenland early in October 1962. The vessel left Japan August 20, 1962, and was expected to arrive on the fishing grounds October 10, 1962. Catches (probably frozen) were to be transshipped to the United States from St. Pierre Island or Trinidad. The Japanese company that operates

Japan (Contd.):

the Aoi Maru maintains a branch office in New York City. Their New York branch office has arranged sales contracts with two fish processing firms in Boston, Mass., for fish transshipped by the Aoi Maru.

The Japanese Fisheries Agency is expected to approve the license application submitted by another Japanese fishing company for permission to fish in the Northwest Atlantic. (Fisheries Attache, United State Embassy, Tokyo, September 14, 1962.)

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STERN TRAWLER TO FISH OFF WEST AFRICA:

A large Japanese fishing firm's stern trawler Akebono Maru No. 50 (1,500 gross tons) left Japan in August 1962 for West African waters and was scheduled to arrive at the fishing grounds off Las Palmas Island in early September.

The stern trawler is the first of the firm's trawlers to operate in the Atlantic Ocean. Another of the firm's trawlers, Akebono Maru No. 53 (1,500 gross tons), currently operating in the Indian Ocean northwest of Australia, is also expected to proceed to the Atlantic Ocean. (Shin Suisan Shimbun Sokuho, August 22, 1962.)

日本

Republic of Korea

CONTRACTS FOR LOAN OF $120 MILLION TO BUILD FISHING VESSELS:

Representatives of an Italian-French combine signed a contract with the Government of the Republic of Korea on August 8, 1962, to provide a $120 million loan for the development of Korea's fishing industry. Certain conditions must be met before the contract becomes binding and some details of the contract still have to be negotiated.

New fishing vessels (729) with a total tonnage of 118,000 tons are to be built with the loan. Most of the vessels are to be built in Europe. Engines and other equipment (except lumber) will be supplied from Europe for the vessels to be built in Korea. All supplies are to be delivered to European ports. As a result of the agreement, South Korea would nearly double its fishing fleet.

The Italian-French combine is to train Korean fishermen and technicians and assist in marketing Korean fishery products throughout the world. It is predicted that the project will boost the annual Korean catch to over one million metric tons and the value of the annual catch to US$70 million. Modern packing facilities would be created at six Korean ports. In 1961, the Korean total catch amounted to 412,000 tons (including 37,000 tons of seaweed) with a value of $29 million.

The contract will go into force after (1) approval of the Korean, Italian, and French Governments: (2) the issuance of credit guarantees by the Italian and French authorities; (3) the deposit of a down payment of 10 percent by the Koreans in Europe; and (4) the deposit of drafts as stipulated in the contract in a bank designated by the Contractor. Further details of the work to be done under the contract are to be negotiated within three months. The combine is to submit for approval by Korea a plan for first priority work. Prices, to be agreed upon by the two parties, are to be "based upon international competitive market prices."

Terms of the contract call for advance payment of 20 percent of the loan, and half of that must be paid in cash in U. S. dollars on specified dates before work on the new vessels begins. Then ten percent of the price of each vessel or unit of equipment is to be paid in U. S. dollar drafts when the unit is delivered to a European port. Eighty percent of the price of each vessel or unit of equipment is to be paid in 7 years in semiannual installments, with an annual interest rate of 5.5 percent. This payment is to be in drafts of U. S. dollars "issued by the Contractor to its own order or to the order of a Financing Institute to be disignated by the Contractor." (United States Embassy, Seoul, August 10, 1962.)

The present agreement is a revision of the Italo-South Korean agreement of February 12, 1962.

Morocco

CANNED FISH PACK AND EXPORTS, 1961/62 SEASON:

The canned fish pack in Morocco during the 1961/62 canning year (June 1-May 31) showed a moderate increase over the previous year.

Morocco's Canned Fish Pack, 1961/62 and 1960/61

Products	1961/1962	1960/1961
	(Cases)	
Sardines or pilchards	2,014,878	1,984,572
Tuna	171,967	130,988
Other fish (incl. mackerel)	315,265	215,891
Total	2,502,110	2,331,451

Although Morocco's exports for the 1961/62 canning year set an all-time high, the sardine industry is in difficulty. After having disappeared from the waters off Safi during July and most of August 1962, the sardine returned but the quality of the catch was reported to be very poor from Casablanca south. In addition, Moroccan sardine exports face difficulties in their major market in France.

The Government has endorsed "Operation Tuna," a plan to promote tuna fishing to offset the poor results being obtained with sardines. Success will depend in part on whether or not arrangements can be made to contract for freezing and factoryships to work together with Moroccan fishing vessels on the high seas. (United States Embassy, Rabat, September 7, 1962.)

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Morocco (Contd.):

FISHING LIMITS EXTENDED TO 12 MILES:

The Government of Morocco on July 27, 1962, announced the extension of Moroccan fishing limits from 6 to 12 miles. The announcement included the statement that the new measure would permit the Government to reinforce its surveillance of its territorial waters and to fight with greater effect against the "systematic ravages" to Moroccan fishing waters. The extension will make it impossible for French and Portuguese fishermen to continue catching sardines off the Moroccan coast. (United States Embassy, Rabat, August 10, 1962; Le Marin, fishery periodical, August 3, 1962.)

Netherlands

JAPANESE CANNED TUNA PRICES, MID-SEPTEMBER 1962:

In mid-September 1962, the wholesale prices of Japanese canned tuna in the Netherlands were as follows:

Tuna in "dressing" sauce (48 6½-oz. cans)	$6.70 per case
Tuna in jelly (48 7-oz. cans)	$6.40 per case

Only a small quantity of Japanese canned tuna is being sold in the Netherlands. The market for canned salmon in the Netherlands is much larger than the market for canned tuna. (United States Embassy, The Hague, September 14, 1962.)

Nigeria

FISH CATCH FROM LAKE CHAD:

The estimated annual catch from the Nigerian sector of Lake Chad is 10,000 metric tons. The annual catch yields about 4,800 tons of dried fish which when marketed has a retail value of about $4.2 million. (Federal Fisheries Service, Lagos, January 1962.)

Note: See also under "Chad."

Norway

EXPORTS OF CANNED FISH, JANUARY 1-JUNE 23, 1962:

Norway's total exports of canned fish during the period January 1-June 23, 1962, were 14.5 percent greater than in the same period of 1961. All of Norway's important canned fish products, except soft herring roe, were exported in greater quantity in 1962. Exports of canned smoked brisling were up 22.8 percent and exports of canned smoked sild were up 19.7 percent.

Norwegian Exports of Canned Fish, January 1-June 23, 1962 1/

Product	1962		1961	
	Metric Tons	1,000 Lbs.	Metric Tons	1,000 Lbs.
Smoked brisling	2,393	5,276	1,948	4,295
Smoked small sild	6,543	14,425	5,472	12,063
Kippered herring	2,422	5,340	2,169	4,782
Soft herring roe	575	1,267	587	1,294
Sild delicatessen	221	487	146	322
Other canned fish	1,709	3,767	1,718	3,787
Shellfish	920	2,028	870	1,918
Total	14,783	32,590	12,910	28,461

1/Preliminary.

During January-May 1962, Norway's total exports of canned fish showed an increase of 11.3 percent in quantity and 15.2 percent in value over exports in the same period of 1961, due mainly to an increase in exports to the United States.

Norway's Total Exports of Canned Fish, January-May, 1961-62 1/

Year	Quantity		Value	
	Metric Tons	1,000 Lbs.	Million N. Kr.	Million US$
1962	12,872	28,378	63.84	8.9
1961	11,565	25,496	55.44	7.8

1/Preliminary.

The United States was the leading buyer of Norwegian canned fish during January-May 1962 with 6,527 metric tons valued at N. kroner 33.2 million (US$4.6 million) as compared with 4,509 tons valued at N. kroner 23.7 million (US$3.3 million) during the same period of 1961. Other important markets for Norwegian canned fish in 1962 were Great Britain, Australia, South Africa, and Canada.

The brisling catch on the west coast has been good this year, although catches declined in July. As of July 21, 1962, the brisling pack totaled 238,763 cases and the small sild pack amounted to 222,130 cases, as compared with 298,522 cases of brisling and 162,219 cases of small sild by the same date last year. (Norwegian Canners Export Journal, August 1962.)

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Norway (Contd.):

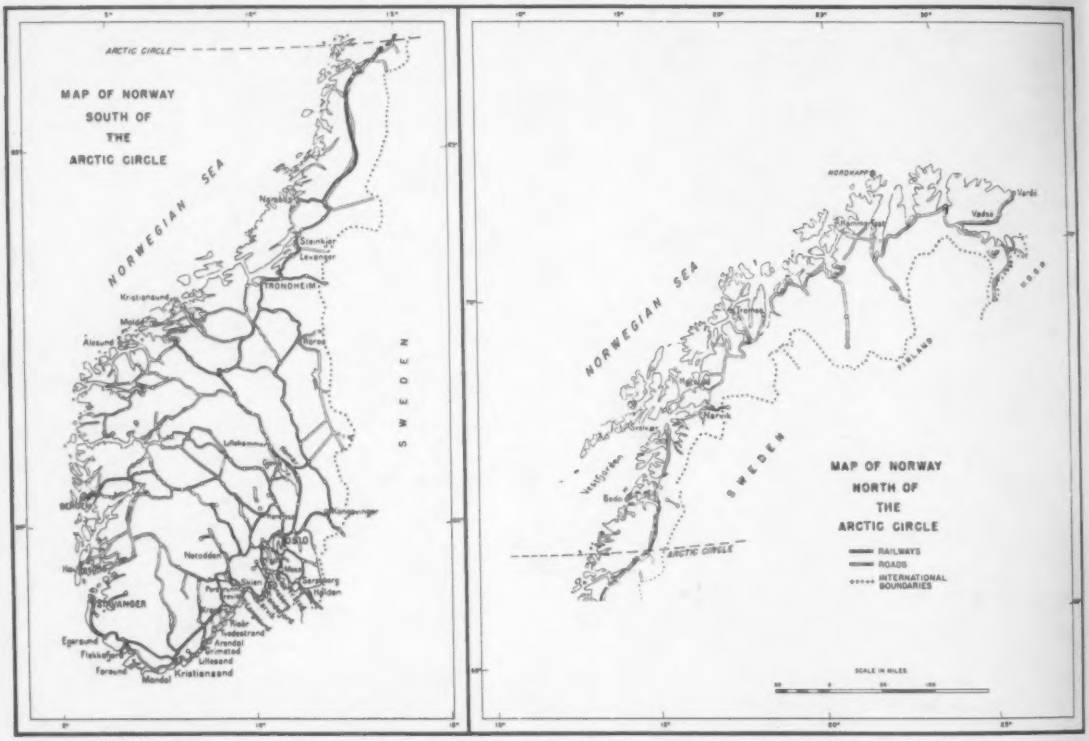
TUNA CATCH IN 1962 EXPECTED TO BE LESS THAN IN 1961:

Norwegian fishermen as of early September had landed about 5,400 metric tons of tuna this year. The tuna fishing season in Norway is from July-October. A total of 160 purse-seiners manned by 1,700 fishermen are engaged in the main tuna fishery off West Norway. Others were fishing for tuna off the Nordland coast.

The tuna catch will probably increase before the season ends, but it is doubtful if it will match the 1961 catch of 6,500 tons with an export value of 15 million N. kroner (US$2.1 million). (Editor's Note: Off the coast of Norway, tuna are more difficult to catch in the fall because the fish on which they feed become less plentiful and the tuna inhabit the deeper waters.) Most of the Norwegian tuna catch is shipped to Italy, but substantial quantities are also exported to West Germany and Czechoslovakia.

The tuna catch and the number of vessels engaged in the fishery fluctuate considerably from year to year. Norwegian fishermen began purse-seining for tuna in 1948. The record catch of about 12,000 tons was made in 1952.

At the World Scientific Meeting on the Biology of Tunas and Related Species, La Jolla, Calif., July 2-14, 1962, a Norwegian scientist reported the results of his investigation of tuna migration. His study showed that bluefin tuna tagged off Spain and the United States migrate to Norwegian waters. (News of Norway, September 6, 1962.)



Peru

GOVERNMENT'S NEW PROCEDURES FOR FISH MEAL PLANT LICENSES:

A new Peruvian law (Decree No. 14195) published in El Peruano, August 29, 1962, establishes new procedures for

Peru (Contd.):

issuance of licenses to fish meal plants in Peru. Significant provisions of the new Decree are:

1. An applicant for a license to establish a new fish-meal plant must pay 500 soles (US$18.65) a ton per hour of raw material capacity.

Fig. 1 - A Peruvian boat with the hold and decks loaded with anchovetas, used for making fish meal and oil. Boat is unloading at the Port of Chimbote.

2. The applicant must obtain authorization from the Office of the Director of Industries and Electricity showing that the plant meets the requirements established for that type of industrial plant.

3. Licenses to set up new plants will be valid for a year and can be renewed for up to one year by making a flat payment of 10,000 soles ($373) for each month of the renewal.

4. Before entering into regular production, the plant must pass a technical inspection.

Fig. 2 - A typical Peruvian anchoveta boat about ready for launching.

5. A register of fish-meal factories will be set up, to include plants already established as well as those to be established under the new law.

6. Registration, bringing with it a definitive license, can be accomplished by payment of 500 soles a ton per hour of raw material capacity. (Existing plants also must be registered and pay this fee.)

7. Those plants having definitive licenses will pay an annual fee of 200 soles ($7.46) per ton of capacity.

8. Money from the fees established in the Decree will be used to carry out the programs of the Fish Service in the Republic, principally the program for utilization of fish products in low-cost food for human consumption.

9. Installation of new fish-meal plants is prohibited in certain zones, including Callao, Chimbote, and Laguna Grande.

10. The Ministry of Agriculture is authorized to establish closed fishing seasons as a conservation measure.

The Peruvian Government has already granted about 40 licenses for new fish-meal plants in recent months. In the past, it usually took several months to obtain a license even under the best of conditions. Under the new system, licenses are expected to be issued within about a week after application. This would obviously make it easy to break into the fish-meal business in Peru if one has sufficient capital. The average cost of installing and starting a fish-meal plant in Peru was recently estimated at about $1 million.

It seems likely that a number of new plants, applications for which were pending under the old regulations, will now be granted licenses and begin operations within the next few months. Peruvian Government officials anticipate, however, that most of the 60 to 65 applications now pending will be dropped, since many of those applications were filed by persons who thought they could get licenses and then sell them at a profit. This resulted from licenses being hard to obtain under the old system. It is believed that individuals who still plan to establish plants will find it difficult, or impossible, to get into production in time to benefit from the good fishing season anticipated in late 1962 and early 1963.

A Peruvian industry source, who thinks there are already too many fish-meal plants in Peru, does not believe many new plants will be established as a result of the new Decree. It was also pointed out that the Government apparently intends to take further steps to regulate the industry, and may very well prohibit fishing at certain times, and in certain areas. Concerning this last point, a Government official stated that the Government has no intention of regulating the commercial side of the industry, but will impose conservation measures if such are necessary. Up to now, the Government official said, there is no indication that the anchoveta supply is being overfished.

Peru's fish-meal production has been increasing steadily and is expected to be more than one million metric tons in 1962. In the first 6 months of 1962, Peru's fish-meal production was reported to be 544,000 metric tons according to preliminary data from the International Association of Fish Meal Manufacturers. Most of the leading countries producing fish meal submit monthly data to the Association. Despite the heavy production, the demand and price of Peruvian fish meal have been holding up. Peru's fish-meal production may continue to increase in 1963, but it is too early at this time to predict or guess what effect it will then have on market conditions and prices. (United States Embassy, Lima, Peru, August 31, 1962.)

Portugal

JOINT JAPANESE-PORTUGUESE TUNA VENTURE PROPOSED:

A large Portuguese firm was reported in August 1962 to have offered a large Japanese fishing company a proposal to establish a joint tuna venture. Under this plan, a tuna base equipped with cold-storage facilities and a packing plant would be established

Portugal (Contd.):

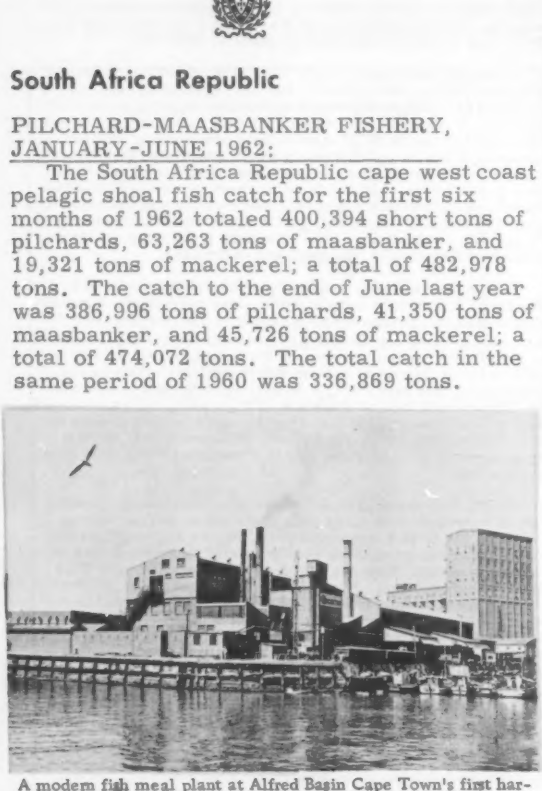
jointly in a Portuguese territory bordering the Atlantic Ocean with Japanese and Portuguese capital, the products to be sold to the European market.

The Japanese firm is said to be studying the offer carefully in view of the tuna import restrictions imposed by the European Common Market. (Shin Suisan Shimbun Sokuho, August 22, 1962.)

South Africa Republic

PILCHARD-MAASBANKER FISHERY, JANUARY-JUNE 1962:

The South Africa Republic cape west coast pelagic shoal fish catch for the first six months of 1962 totaled 400,394 short tons of pilchards, 63,263 tons of maasbanker, and 19,321 tons of mackerel; a total of 482,978 tons. The catch to the end of June last year was 386,996 tons of pilchards, 41,350 tons of maasbanker, and 45,726 tons of mackerel; a total of 474,072 tons. The total catch in the same period of 1960 was 336,869 tons.



A modern fish meal plant at Alfred Basin Cape Town's first harbor of the last century. The basin is now used mainly by South Africa's deep-sea trawling fleet.

According to figures released by the Division of Sea Fisheries, the June catch was 13,615 tons of pilchards, 10,585 tons of maasbanker, and 34 tons of mackerel; a total of 24,507 tons. This compares with 43,181 tons of pilchards, 11,439 tons of maasbanker, and 10 tons of mackerel in June last year; and with 50,141 tons of pilchards, 1,707 tons of maasbanker, and 80 tons of mackerel in June 1960.

The June 1962 catch yielded 6,376 short tons of fish meal, 457,273 gallons of fish body oil, 1,798,432 pounds of canned pilchards, and 2,564,016 pounds of canned maasbanker.

During June, the shoal fishing industry at Walvis Bay in South-West Africa landed 75,387 short tons of pilchards, and the catch there to the end of June totaled 267,794 short tons. (The South African Shipping News and Fishing Industry Review, August 1962.)

South-West Africa

LARGE ORDER OF CANNED FISH SOLD TO PHILIPPINES:

The South-West African fishing industry has received an order for 900,000 cases of canned fish from the Philippines. The order is valued at about R3 million (US$4.2 million) and will be shipped in September, October, and November of this year. The Philippine Government's buying organization (NAMARCO) is the purchaser.

Sales of canned fish to the Philippines had been in jeopardy for many months because of the Philippines' foreign exchange problems. Consequently, the South-West African fishing industry was greatly relieved at the consummation of this very large order. (United States Embassy, Pretoria, September 6, 1962.)

Spain

BILBAO FISHERIES TRENDS, SECOND QUARTER 1962:

A total catch of about 3,500 tons of tuna was reported by the 16 Spanish vessels from northern Spain that fished off Dakar and Abidjan, West Africa, in the winter tuna season of 1962. It was Spain's most profitable and successful winter tuna season in the past six years, although catches declined to about one-third of the fleet's capacity in April. The Spanish fleet returned to its home ports at the end of April. It is believed that about 30 Spanish vessels plan to fish for tuna off Africa in the fall of 1962.

The 1962 summer tuna season in those waters began in early June. Initial catches and prospects were good. The early catches

Spain (Contd.):

brought about 60 pesetas a kilogram ($1,000 a metric ton) in the local retail market for fresh consumption as compared to 45 pesetas a kilogram ($750 a metric ton) last year.

Anchovies off Spain had been abundant and of good quality and size long before the traditional start of the season on March 1. But anchovy catches during the second quarter of 1962 did not live up to expectations. They were sporadic due to weather conditions and often consisted of small fish. The fish caught was sold mostly for fresh consumption since the prices were too high for the canneries. The total second quarter anchovy catch in the Bilbao district was reported to have been 30 percent less than in the same period of 1961. The average wholesale price in the fishing ports was estimated to have been about 5 pesetas a kilogram (about 3.8 U. S. cents a pound), or twice the price of last year. In view of the light anchovy catches, the Fishermen's Brotherhood increased temporarily the maximum catches per vessel per day from 8,000 kilograms to 10,000 kilograms. (United States Consulate, Bilbao, August 8, 1962.)

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TUNA PACKERS SWITCH TO CANNING IN OIL:

The Spanish tuna packing plants seem to have switched to tuna in olive oil from tuna in brine as of August 1962. In European markets tuna canned in olive oil packed in Spain has begun to appear in a noticeable quantity. (Suisan Tsushin, August 23, 1962.)

Tunisia

YUGOSLAV-BUILT FISHING VESSELS DELIVERED TO TUNISIA:

Five Yugoslav-built seiners were delivered on August 22, 1962, to the Tunisian National Office of Fisheries. Completely equipped, including electronic gear and refrigeration equipment, each of the 60-ton vessels cost about US$70,000. These vessels are the first to be delivered under an agreement signed in March 1962. (United States Embassy, Tunis, August 24, 1962.)

U.S.S.R.

SOVIETS BUILD FIRST TUNA LONG-LINE VESSEL:

The hull of the first Soviet tuna long-line vessel was laid in a Far East shipyard in the spring of 1962. The vessel, designed by Lenigrad engineers, will have a displacement of 1,000 tons and be capable of fishing for 50 days without touching at port. The vessel's two storage holds with a combined capacity of 100 tons will be refrigerated by a dry method. The vessel will be equipped with a long-line 46.6 miles long with 1,750 hooks; the latest navigation instruments; and fish-finding equipment. The long-line will be set and raised by two winches and tuna processing work will be mechanized. The crew will be quartered in one- and two-berth air-conditioned cabins. (Leningradskaya Pravda, June 29, 1962.)

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SOVIETS DESIGN COMBINATION FACTORYSHIP-RESEARCH VESSEL:

Lenigrad engineers have drawn plans for a vessel that will be a floating laboratory as well as a modern commercial stern trawler-factoryship. The vessel will be equipped with 11 research laboratories, submerged port holes for underwater observations, a hydrostat that can be lowered to a depth of 600 meters to collect oceanographic data, and 2 aquariums with continuous running water for holding fish under study. But it will also be equipped for stern trawling and purse-seining. A fish meal and oil reduction plant and fish freezing facilities will be installed. It will have a carrying capacity of 300 tons of frozen fish, as well as space for canned fish, cod-liver oil, and "fish flour." The fishing operations of the vessel are expected to pay half of the maintenance costs as well as help determine the best fishing methods.

The Soviets plan to use the vessel in the study of marine life in the near-bottom layers of the sea, marine microfauna and microflora, fish nutriment resources, and other studies. The vessel's laboratories are designed for hydrological, ichthyological, hydromechanical, microbiological, and other research.

The vessel will be named after N. M. Knipovich, a zoologist who founded the Soviet school of ichthyologists and organized a num-

U. S. S. R. (Contd.):

ber of Soviet fishing research expeditions. (Leningradskaya Pravda, June 29, 1962.)

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SOVIET-BLOC FISHING ACTIVITIES IN NORTH ATLANTIC:

The Soviet Union continues to utilize the fishery resources of Georges Bank as evidenced by the presence, during August 1962, of a Soviet fleet consisting of 125 to 160 vessels. In addition, several trawlers from East Germany and Poland were also on Georges Bank fishing for herring. (Unpublished sources.)

A 1,500-ton stern trawler-factoryship operating on the Grand Banks.

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EXPLORATORY FISHING OFF SOUTH ATLANTIC COAST:

A Soviet exploratory fishing vessel was reported off the east coast of Florida during August 1962. The vessel, the Boguchar, is a 150-foot refrigerated medium trawler of the Okean class. Earlier in the year (June 1962) the same vessel was reported seeking menhaden off the coast of South Carolina. (Unpublished sources.)

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FISHING ACTIVITIES IN GULF OF ALASKA:

Soviet fleets in the Gulf of Alaska during August 1962 continued to fish for Pacific ocean perch. In early August, a mothership and several trawlers were reported taking king crab southwest of Kodiak Island. (Unpublished sources.)

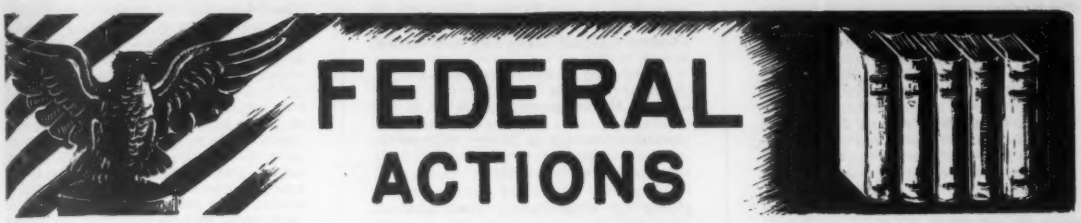
SHARK SWALLOWS DRIFT BOTTLE

Apparently mackerel sharks couldn't care less what they eat. A member of that species of the sharp snout and the razor-like teeth swallowed a drift bottle around Georges Bank about 150 miles off the western tip of Nova Scotia.

The drift bottle encountered the shark--or vice versa--about a month after it had been cast overboard from the car ferry Bluenose somewhere between Yarmouth and Bar Harbor, Maine. The bottles are released by the Fisheries Research Board of Canada through its biological station at St. Andrews, N.B., for the purpose of getting information on currents. The bottle in question was one of many thrown into the sea in connection with a study of herring movements now being conducted by the Board's biologists.

Inside the bottles are written instructions asking the finder to return information to the Board concerning the time and place where the bottles are found. A reward of one dollar is paid to the person forwarding the information.

A United States fisherman from Quincy, Mass., returned the information about the bottle found inside the shark. The big fish was caught at the northeast peak of Georges Bank in the North Atlantic. (Canadian Department of Fisheries Trade News, April 1962.)



Civil Service Commission

FISHERY AND WILDLIFE BIOLOGISTS EXAMINATION ANNOUNCED:

The U. S. Civil Service Commission reannounced on August 21, 1962, the "Fishery Biologist and Wildlife Biologist" examination (Announcement 285 B). There is no closing date for the examination.

Fishery and Wildlife Biologists perform professional and scientific work in connection with the conservation and management of fish and other aquatic organisms, such as crustaceans and mollusks, and of various forms of wildlife.

Announcement No. 285 B gives the educational, experience, and training requirements, as well as a more detailed description of the work and duties involved. Copies can be obtained from U. S. Civil Service Regional Offices, or from the U. S. Civil Service Commission, Washington 25, D. C.

Applications for the examination are to be sent to the Executive Secretary, Board of U. S. Civil Service Examiners, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C. Applications will be accepted until further notice.

Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

OBJECTIONS TO STANDARD OF IDENTITY FOR CANNED TUNA DISALLOWED:

Objections to the requirement that (1) the words "in water" be included in the name on the label of canned water-pack or in-brine tuna and (2) tuna darker than Munsell value 5.3 be labeled "dark tuna" rather than simply "tuna" were disallowed by the Food and Drug Administration in a final order on the standard of identity for canned tuna published in the Federal Register of September 7, 1962. The order affirmed the proposed findings of fact published in the Federal Register of March 31, 1961. The labeling requirements of the standard of identity for canned tuna become effective 120 days from September 7, 1962, the date the final order was published in the Federal Register.

A notice of a proposal to establish a definition and standard of identity and a standard of fill of container for canned tuna was first published in the Federal Register of August 28, 1956. No objections were filed to the fill of container standard and compositional requirements of the identity standard and the effective date of those provisions was set out in the order of February 13, 1957 (22 F.R. 892). In recognition of the objections to the labeling requirements of the identity standard, those requirements were stayed pending a decision on the objections indicated above.

The final order as it appeared in the September 7, 1962, Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

[Docket No. FDC-64]

PART 37—FISH; DEFINITIONS AND STANDARDS OF IDENTITY; STANDARDS OF FILL OF CONTAINER

Findings of Fact and Order Ruling on Objections to Standard of Identity for Canned Tuna

In the matter of establishing a definition and standard of identity for canned tuna fish:

In the FEDERAL REGISTER of August 28, 1956 (21 F.R. 6492), there was published a notice of a proposal to establish a definition and standard of identity and a standard of fill of container for canned tuna fish. An order was published February 13, 1957 (22 F.R. 892), adopting the proposals, with modifications. Subsequently, objections were filed, and a public hearing was requested on two of

the labeling requirements in the identity standard: (1) The requirement that tuna darker than a prescribed level be labeled "dark"; and (2) the requirement that for water-pack tuna the name on the label should include the words "in water". By an order published in the FEDERAL REGISTER of August 29, 1957 (22 F.R. 6961), notice was given that no objections had been filed to the fill of container standard or to the compositional requirements of the identity standard, and the effective date for these provisions, as set out in the order of February 13, 1957 (22 F.R. 892), was confirmed. In recognition of the objections to the labeling requirements of the identity standard, these requirements were stayed pending the outcome of the hearing on the issues raised by the objections (23 F.R. 245).

Pursuant to a notice of hearing published in the FEDERAL REGISTER (22 F.R. 10964), a public hearing was held to receive evidence on the issues raised by the objectors. Thereafter a tentative order including proposed findings of fact was published March 31, 1961 (26 F.R. 2723). Exceptions to this tentative order were filed in behalf of distributors of water-pack tuna imported from Japan. These exceptions challenged the conclusion that the objectors had failed to prove that the interests of consumers would be promoted by rescinding the provision requiring that the words "in water" be included in the name on labels of water-pack tuna. The record has been restudied, in the light of the exceptions, and findings concerning the objectors' claim that consumers usually discard the oil from oil-pack tuna have been revised. However, these revisions do not alter the ultimate conclusion that consumer interests would not be served by rescinding the requirement for including the words "in water" in the name on labels of water-pack canned tuna.

On the basis of the evidence received at the hearing, and pursuant to the authority vested in the Secretary of Health, Education, and Welfare by the provisions of the Federal Food, Drug, and Cosmetic Act (secs. 401, 701(e)(3), 52 Stat. 1046, 1055 as amended 70 Stat. 919; 21 U.S.C. 341, 371(e)(3)) and delegated to the Commissioner of Food and Drugs by the Secretary (25 F.R. 8625), and after consideration of the exceptions filed, which are adopted in part and rejected in part as is apparent from the detailed findings herein made; *It is ordered:*

A. That the findings of fact in the above-identified matter be established as follows:

Findings of fact.[1] 1. By an order published in the FEDERAL REGISTER of February 13, 1957 (22 F.R. 892), a definition and standard of identity for canned tuna fish was promulgated. Objections were filed protesting those portions of the order requiring that tuna darker in color than Munsell value 5.3 be declared on the label as "dark tuna" and that the name on the label of canned tuna packed in water rather than in oil include the words "in water" as a part of the name of the food. Notices of the objections, the stay of the labeling requirements, and the announcement of the public hearing on the objections were published in the FEDERAL REGISTER on August 29, 1957 (22 F.R. 6961), and December 28, 1957 (22 F.R. 10964). (Ex. 2, 4, 5, 7, 23)

2. The only issue concerning the color of canned tuna to be determined on the basis of the evidence was raised in the objection filed by one packer, the operator of a cannery in Maine, who advocated changing the wording of § 37.1(d)(3) of the standard from:

(3) *Dark.* This color designation includes all tuna darker than Munsell value 5.3, to

(3) *Tuna.* This designation includes all tuna darker than Munsell value 5.3 canned from the light meat of tuna.

The objection did not make an issue of whether the method specified in the order was appropriate for making the differentiation between dark and light tuna; of whether the value for such differentiation was properly set at 5.3 on the Munsell scale; or of whether the standard should require the label designation for tuna darker than Munsell value 5.3 to be different from the label designation for tuna lighter than Munsell value 5.3. The sole issue was whether the standard should require cans containing tuna darker than Munsell value 5.3 to be labeled "dark tuna" rather than simply "tuna." (R. 9, 11–12, 14, 17, 38, 47, 54–55; Ex. 7)

3. The only witness who supported the objection to the label declaration "dark tuna" sometimes employed the phrase "light meat of tuna" to mean striated muscular tissue, as specified in § 37.1(c) of the standard, without regard to the color shade of such tissue. At other times, when referring to this same striated muscular tissue (as prepared from large blue-fin tuna and from Atlantic little tunny), the witness used the term "dark meat." Apparently, it was for this dark-colored striated muscular tissue that he urged the change of the standard to provide for labeling it by the unmodified word "tuna" though he sometimes used the designation "dark meat" or "black meat" to mean nonstriated tissue, which is an entirely different part of the fish and which the standard requires to be eliminated before canning. (R. 18, 33–34, 37, 43, 50, 66)

4. Several kinds of tuna have been caught in the Atlantic waters, but the only color determinations reported in the record are for the categories little tunny; large blue-fin tuna, exceeding 500 pounds in weight; and blue-fin tuna ranging in weight from 20 pounds to 104 pounds. These color determinations showed that little tunny and the large blue-fin tuna yield canned tuna of color darker than Munsell 5.3. The canned tuna prepared from the smaller blue-fin tuna (those not exceeding 104 pounds in weight) measured lighter than Munsell 5.3. (R. 10, 18, 29–30, 54, 58, 60, 74, 76; Ex. 8)

5. The canned article prepared from large blue-fin tuna, where the fish weighed in excess of 500 pounds each, not only was of a dark color but it was coarse in texture and had a distinctive taste, described as stronger, heartier, and more fishy. The opinion was expressed that this darker colored, stronger flavored article prepared from large blue-fin tuna would appeal to a limited segment of consumers. (R. 14, 33–35, 46–47, 58–59)

6. The responses to a questionnaire answered by more than 4,000 consumers showed an interest on the part of a substantial number of consumers in having labels show whether the meat in the can is light or dark. A consumer survey in which interviewers visited 252 households in which the homemaker used canned tuna showed that 65 percent of these homemakers regarded a color photograph of a can of tuna measuring 5.3 on the Munsell scale as dark tuna. Over two-thirds of the homemakers interviewed were interested in whether the tuna they serve is light or dark tuna, and substantially all wanted the label on the cans to show whether the tuna is light or dark. (R. 140–141, 162–164, 168, 172, 184–189, 202–204, 210–212, 273, 278–279, 281–282; Ex. 14, 17, 18, 24, 25, 26)

7. In households where canned tuna is used, one of the forms in which it is most frequently served is as a salad. For use as a salad the color of tuna is important to housewives and they wish to avoid dark tuna for salads. (R. 42, 168–169)

8. The other issue for the hearing arose from objections filed by distributors of water-pack tuna imported from Japan. These distributors objected to the requirement that the name on the label of such canned tuna should include the words "in water." They asserted: (a) That showing the words "in water" in the name would lead consumers to believe that water would be a major ingredient of the food and that cans so labeled would contain less fish than equal-sized cans of oil-pack tuna; (b) that consumers usually discard the oil from oil-pack canned tuna; (c) that by inference the provision concerning label declaration of the words "in water" requires that these words must follow the word "tuna" in the same line on labels. They declared that these assertions would be proved by consumer letters and consumer-survey data that would be produced at the hearing. (R. 86–87, 91, 98, 101, 106–107, 109, 111–114, 134–135; Ex. 23)

9. Historically, it has been conventional to use vegetable oil as the packing medium for canned tuna. Tuna canned in the United States, with the exception of tuna prepared for special dietary usage, has been packed in oil. Around 1951 or 1952 small quantities of imported canned tuna packed in water appeared on the United States markets. Since then, the volume of imported water-pack tuna has increased considerably but remains substantially below the total volume of oil-pack tuna on the market. (R. 108, 112, 121, 127, 145–146, 148–149, 173, 249–250; Ex. 15, 16)

10. By various expressions the objectors asserted that consumers usually discard the oil from oil-pack tuna. Two objectors stated that the oil is "in practically all instances discarded"; one that it "is usually discarded"; another that it is "common practice to discard the oils"; and two objectors asserted that it is safe to state that 98 percent of consumers dispose of the oil "since it is not considered an edible part of the contents." The objectors failed to prove their assertions. The results of a questionnaire-type survey submitted by the Food and Drug Administration showed that of more than 4,000 consumers who answered the questionnaire, 56.4 percent reported that when using oil-pack tuna they either always or sometimes use the oil. This percentage agrees well with data published by the Fish and Wildlife Service of the United States Department

[1] The citations following each finding of fact refer to the pages of the transcript of testimony and the exhibits received in evidence at the hearing.

of the Interior, showing that of more than 1,900 homemakers interviewed in a 1956 survey, 38.7 percent reported that in using oil-pack tuna they always use the oil with the fish and 20.4 percent reported that they sometimes use the oil. (R. 109, 150, 278–279; Ex. 16, 24–26)

11. Consumers are concerned whether the canned tuna they purchase is the conventional oil-pack article or is tuna packed in water. Some labels on water-pack tuna have shown "no oil added" or "without added oil," but, in general, the declaration that the tuna is packed in water has been so subordinated on labels that consumers would be apt to overlook it under customary conditions of purchase. Housewives serve canned tuna in various ways; they make salads, sandwiches, casserole dishes, tuna-with-noodles, and use tuna in other cooked dishes. Generally, recipes for the cooked dishes, and frequently those for tuna in salads, call for using the oil from the can along with the tuna fish. The oil adds richness and significantly increases the caloric value of the dishes. When following such recipes, a housewife using water-pack tuna needs to add butter, margarine, or salad oil. It promotes her interests for the label declaration showing that the tuna is packed in water to be so displayed that under ordinary conditions of purchase she will note it.

Some distributors of imported water-pack tuna have sought in their promotions to appeal to those consumers who wish to avoid high-calorie foods. These promotions have emphasized that canned tuna where water has been substituted for oil as the packing medium is lower in caloric value than conventional oil-pack tuna. The interest of these consumers also is promoted by a prominent label declaration to show that the tuna is packed in water. (R. 120, 128, 134, 137, 138, 167–174; Ex. 12)

12. A consumer survey especially designed to elicit evidence from a fair sample of homemakers on the issues raised in the objections to the canned tuna order was carried out by an organization experienced in conducting such consumer interviews. In this survey homemakers were shown cans of water-pack tuna under conditions designed to simulate those she would experience in marketing for canned foods. For cans with commercial labels, fairly representative of the labels that have been used on water-pack tuna and showing "Packed in water" on side panels, two-thirds of the homemakers interviewed mistakenly thought that the tuna was packed in oil. (R. 79–83, 178–190, 200–202, 207–210, 219, 221–223, 237, 245, 255, 270–271; Ex. 17–22)

13. The evidence at the hearing did not support the assertion by the objectors that including the words "in water" in the name on labels of water-pack tuna would lead consumers to believe water to be a major ingredient and to believe that the cans so labeled would contain less fish than similar cans of oil-pack tuna. In the consumer survey described in Finding 12, the interviewers showed homemakers cans of water-pack tuna with labels specially printed to conform to the requirements of the standard. The names on the labels were:

LIGHT TUNA FLAKES
IN WATER

and

SOLID PACK
LIGHT TUNA IN WATER

The homemakers were asked whether they thought the cans of water-pack tuna would contain less fish, the same amount of fish, or more fish than cans of the same size where the tuna is packed in oil. Half the homemakers answered that the amount of fish would be the same and the others divided about equally between answering that there would be less fish or more fish in the cans of water-pack tuna. Two witnesses trained in statistically evaluating such data testified that these results do not support the claim that showing the words "in water" in the names on labels would lead consumers to believe the cans contain less tuna fish. (R. 87, 106–107, 111–112, 135, 204, 213–214, 251, 267–269, 274–275; Ex. 17–22)

14. The objectors to the labeling requirement for water-pack tuna failed to show that it would promote consumer interests to rescind the provision that the words "in water" be included in the name and to substitute a requirement that water be named on labels as an optional ingredient. One witness, supporting the objections, expressed approval of a suggestion that the words "in water" be shown on labels in type half as large, and on a line below, the other words in the name. A witness, trained and employed in the field of home economics, objected to the use of smaller type for the words "in water." She explained that women are accustomed to getting tuna packed in oil and for that reason when the tuna is packed in water the label should declare "in water" in easily legible type. She made no specific objection to the suggestion that these words be shown in a line immediately below other words in the name. (R. 97, 152, 154, 156, 165–168, 170, 173)

B. That the objections to the standard of identity be disallowed.

Effective date. Provisions A and B of this order are effective 120 days from the date of publication in the FEDERAL REGISTER.

C. That the stay as to the effective date of the labeling requirements of § 37.1(h) of the standard of identity for canned tuna (23 F.R. 245) shall terminate 120 days following the date of publication of this order in the FEDERAL REGISTER.

(Secs. 401, 701(e)(3), 52 Stat. 1046, 1055 as amended 70 Stat. 919; 21 U.S.C. 341, 371(e),(3))

Dated: August 31, 1962.

GEO. P. LARRICK,
Commissioner of Food and Drugs.

Note: See Commercial Fisheries Review, May 1961 p. 68, July 1961 p. 98.

SPEAR

The spear is a fishing implement provided with two or more pointed barbed or barbless prongs or blades. The blades are usually not detachable from the handle or shaft. The instrument is generally thrown by hand. A rope is sometimes fastened to the shaft to aid in retrieving the spear.

Spear.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

More Fish Eaten Per Capita in 1961

Department of the Interior

COMMERCIAL FISHERIES BUREAU EMPLOYEE APPOINTED ASSISTANT TO INTERIOR'S SCIENCE ADVISER:

Howard H. Eckles, of McLean, Va., has been appointed assistant to the Interior Department's science adviser, Secretary of the Interior Stewart L. Udall announced on September 14, 1962. Eckles, a career employe, has been serving as chief of the Branch of Marine Fisheries in the Fish and Wildlife Service's Bureau of Commercial Fisheries since 1958. He joined the Department in 1948 as a research biologist and has served since then in progressively higher positions.

Howard H. Eckles.

Secretary Udall said, "We have established this position under the Department's Science Adviser, Dr. Roger Revelle, for the purpose of broadening the career experience of the younger, talented scientists of the Department." Eckles is the first to be appointed and will return to the Bureau of Commercial Fisheries upon completion of his assignment.

FISH AND WILDLIFE SERVICE

PROPOSED REGULATIONS FOR ENFORCEMENT OF DESIST ORDERS AGAINST POSSIBLE RESTRAINT OF TRADE BY FISHERY COOPERATIVES:

The Department of the Interior published in the Federal Register of August 31, 1962, proposed rules of procedure governing the enforcement of the issuance of cease and desist orders against associations of producers of aquatic products that the Secretary of the Interior has reason to believe are monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced. The proposed regulations give the scope of the rules, and have provisions for institution of proceeding, complaint, notice of hearing, intervention, hearing, and preparation and issuance of final decision and order.

Interested persons had until September 29, 1962, to submit comments, suggestions, or objections on the proposed regulations.

The Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521-522), the functions under which were transferred to the Secretary of the Interior by 1939 Reorganization Plan No. II, in section 2 thereof provides a remedy whereby the associations of producers of aquatic products authorized by section 1 of the Act may be ordered by the Secretary of the Interior to cease and desist from monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof. The proposed rules implement section 2 of the Act by establishing the procedure to be followed by the Secretary of the Interior or his authorized representative, in the inforcement of the section.

* * * * *

BUREAU OF COMMERCIAL FISHERIES

SHELLFISH EXPERT TRANSFERRED TO PACIFIC COAST:

Dr. Victor L. Loosanoff, an internationally-recognized authority in shellfish biology, was appointed by the U. S. Fish and Wildlife Service's Bureau of Commercial Fisheries to the position of Research Fishery Biologist on the Pacific Coast, effective October 1, 1962, the Department of the Interior announced. He will be stationed in Tiburon, Calif. Loosanoff has been director of the Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., since it was established in November 1931.

During his career, devoted almost entirely to research on the biology of oysters, clams, and other marine invertebrates and their enemies, he has made major scientific breakthroughs--notably in the development of methods for the farming of mollusks and their ar-

tificial propagation under hatchery conditions, and in his oyster pests control studies resulting in the development of a "fence" of chemically-treated sand which effectively prevents the invasion of oyster beds by oyster drills, one of the oysters' deadliest predators. Work is continuing on both of these achievements to enable their potential economic benefits to be made available to the industry.

In recognition of the importance of utilizing to the maximum extent the talents and experience of our Nation's most outstanding scientists, Loosanoff's promotion will relieve him of administrative duties and permit him to continue his valuable shellfish research. In addition to the already impressive list of published reports on his work, completion of the study, analysis, and publication of other accumulated data from his 30 years of shellfish investigations, which will be accomplished in his new position, will be of inestimable value to the science of shellfish biology throughout the world.

Loosanoff's location on the West Coast will also make him available, as requested, for consultation and advisory services to the shellfish authorities of the Pacific States, and to educational institutions and their graduate students in aquatic biology.

Eighty-Seventh Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

AMERICAN SAMOA INCLUDED IN CERTAIN LAWS: The House on Aug. 23, 1962, received the conference report (H. Rept. No. 2264) on H.R. 10062, to extend the application of certain laws to American Samoa. Would authorize the Secretary of the Interior to request Federal departments, corporations, or agencies to extend, without reimbursement, scientific and technical assistance to promote the welfare of the territory. Examples of the sorts of technical assistance which may be called for from time to time include revision of Samoa's tax structure, education, agricultural and fisheries production and marketing, harbor improvement, public utilities, and land planning and zoning. There is a limitation of an aggregate of $250,000 in any one fiscal year.

House Report No. 2264, Extending the Application of Certain Laws to American Samoa (Aug. 23, 1962, Report from the Committee of Conference, United States House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 10062), 3 pp., printed. The Committee of Conference agreed to recommend to their respective Houses that the House recede from its disagreement to the amendments of the Senate and agree to the same with an amendment.

The Senate on Aug. 28, 1962, adopted the conference report (H. Rept. No. 2264) on H.R. 10062, to extend the application of certain laws to American Samoa.

The House conferees and the Senate conferees agreed that authority to request technical assistance from other departments shall rest with the Secretary of the Interior, instead of the Governor of Samoa. It was also agreed that benefits from the School Lunch Act and the other acts included in the bill shall not become effective except upon request of the Secretary of the Interior made to the Secretary of Agriculture and to the Secretary of Health, Education, and Welfare.

The House on Aug. 30, 1962, adopted the conference report (H. Rept. 2264) on H.R. 10062.

The House and the Senate on Sept. 4, 1962, approved H. Con. Res. 519, that the President of the United States is requested to return to the House of Representatives the enrolled bill H.R. 10062, to extend the application of certain laws to American Samoa, for re-enrollment in conformance with the conference report (H. Rept. No. 2264) thereon adopted by the two Houses.

The President of the United States on Sept. 25, 1962, signed H.R. 10062, to extend the application of certain laws to American Samoa (P.L. 87-688).

ATOMIC ENERGY AGENCY: The Fifth Annual Report Covering U.S. Participation in the International Atomic Energy Agency for 1961 (Message from the President of the United States Transmitting the Fifth Annual Report Covering U.S. Participation in the International Atomic Energy Agency for the Year 1961, Pursuant to the International Atomic Energy Agency Participation Act), H. Doc. 538, 40 pp., printed. Contains the Annual Report on the activities of the International Atomic Energy Agency (IAEA) and on the participation of the United States therein, presented to Congress by the President; letters of transmittal; operational activities (consist of preliminary assistance missions, training courses and fellowships and exchange of scientists, experts and equipment, information and conferences, research etc.; relations with other organizations; and administrative and budgetary matters. A report on the fifth regular session of the General Conference of IAEA is also included. In research, studies are under way on soils, fertilizers and plant growth, entomological problems, animal diseases, and food preservation. Agreement was reached during 1961 on a 3-year joint research program with the Oceanographic Institute in Monaco. Under the a-

greement work began on the study of radionuclides and their concentrates in organisms in the sea and the effects of such concentrates on the organisms. In its program relating to radioactive waste disposal, the Agency convened panels that dealt with (1) problems of disposal of wastes into fresh water, (2) preparation of a manual on safe disposal of small-scale users, (3) methods of monitoring disposal into the sea and standardizing sampling and analysis of radionuclides in sea water and in marine products, and (4) methods of treating and storing radioactive wastes rather than discharging them into the environment. The publications issued the previous year by the IAEA also are listed.

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The Senate Committee on Commerce on Aug. 24, 1962, continued hearings on S. 3243, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. Testimony was heard from various agencies and industry personnel. Hearings were recessed subject to call.

The Senate Committee on Commerce resumed hearings Sept. 10-12, and again on Sept. 24-26, 1962, on S. 3243.

FISHERY RESOURCES INTERNATIONAL CONFERENCE: S. Res. 392 (Magnuson et al) introduced in the Senate on Sept. 14, 1962, to express sense of the Senate on International Conference on the Conservation of Fishery Resources; referred to the Committee on Commerce. Upon introducing this legislation, Senator Magnuson stated that the "fisheries are an important economic and employment factor in 22 of our 50 states which front the oceans, and to a degree in the 8 others which border the Great Lakes which we share with Canada. Our fisheries are international, and the problems which confront our fisheries and those of other nations of the world are international." One of the problems is maintaining the species which man has found most desirable as food, and also the species for which important industrial uses have been found. For several species, the peril point already has been reached; for others it is approaching. With the great population increases expected over the years, the demands for protein foods will be inevitable from whatever source they may be obtained and one of the principal sources is the sea and shore.

The nations of the world must not only begin to think about conservation, but must do something about it; and that requires understanding, mutual agreements, and accommodations."

The Senate on Sept. 20, 1962, received a favorable report (S. Rept. 2112) from the Committee on Commerce on S. Res. 392.

The Senate on Sept. 20, 1962, considered and agreed to S. Res. 392: Resolved, That it is the sense of the Senate that the President should propose an International Confernece on the Conservation of Fishery Resources to consider the technical, economic, and scientific problems relating to the conservation, utilization, and regulation of living marine resources in the high seas and estuarine waters of the world, and that government, industrial, scientific, and technical participation in such Conference on as wide a basis as may be practicable should be encouraged." Since this is a Senate resolution no House action is required.

FOOD AND AGRICULTURE ACT OF 1962: The House on Sept. 17, 1962, received the report (H. Rept. 2385) from the Committee of Conference on H.R. 12391, to improve and protect farm income, to reduce costs of farm programs to the Federal Government's excessive stocks of agricultural commodities, to maintain reasonable and stable prices of agricultural commodities and products to consumers, to provide adequate supplies of agricultural commodities for domestic and foreign needs, to conserve natural resources, and for other purposes. Included is an amendment which defines "farmers" to include persons who are engaged or intend to engage in fish farming, and the term "farming" to include fish farming.

The House on Sept. 20, 1962, adopted the conference report (H. Rept. 2385) on H.R. 12391.

The Senate on Sept. 25, 1962, adopted the conference report (H. Rept. 2385) on H.R. 12391; thus clearing the bill for the President's signature.

The President on Sept. 27, 1962, signed H.R. 12391 (P.L. 87-703).

INDEPENDENT OFFICES APPROPRIATIONS: The House Committee on Appropriations July 27, 1962, reported out of Committee (H. Rept. 2050) appropriations for independent offices. On July 30, 1962, H.R. 12711 was introduced in the House, making appropriations for sundry independent executive bureaus, boards, commissions, corporations, agencies, and offices for the fiscal year ending June 30, 1963, and for other purposes. Passed the House on Aug. 1, 1962. Received in the Senate on Aug. 2, 1962, referred to the Committee on Appropriations. Reported to the Senate from the Committee on Appropriations (S. Rept. 1923) on Aug. 27, 1962. Passed the Senate, amended on Aug. 31, 1962. The Senate insisted on its amendments and asked for a conference with the House. The House on Sept. 13, 1962, agreed to a conference. The conference report was filed Sept. 14, 1962 (H. Rept. 2376).

H. Rept. 2376, Independent Offices Appropriation Bill, 1963 (Sept. 14, 1962, a report from the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 12711), 20 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses. Included are funds for the Office of Science and Technology. The Committee appropriates $750,000 for salaries and expenses instead of $700,000 as proposed by the House and $850,000 as proposed by the Senate. The Congress has laid down programs concerning the National Aeronautics and Space Administration, the National Science Foundation, the Atomic Energy Commission, and other agencies. The conferees ask the Director of the Office of Science and Technology that any changes in those scientific programs be submitted for the approval and action of the Congress.

The House on Sept. 18, 1962, concurred with the conference report (H. Rept. 2379) on a number of Senate amendments, but insisted on its disagreement on three Senate amendments. The Senate on Sept. 19, 1962, agreed to the conference report and insisted on its amendments and asked for a further conference.

The House and the Senate, Sept. 25, 1962, received from the Committee of Conference the further conference report (H. Rept. 2466) on the amendments still in dispute on H.R. 12711.

H. Rept. 2466, Independent Offices Appropriations Bill, 1963 (Sept. 25, 1962, a report from the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 12711), 3 pp., printed. The Committee of Conference having reached an agreement on the amendments in dispute on the bill recommended passage to their respective Houses. Contains a statement on the Managers on the part of the House.

The Senate and the House on Sept. 25, 1962, adopted the conference report (H. Rept. 2466) on H.R. 12711, making appropriations for sundry independent executive bureaus, boards, commissions, corporations, agencies, and offices for the fiscal year ending June 30, 1963, and for other purposes. Included are funds for the Office of Science and Technology. The Congress has laid down programs concerning the National Aeronautics and Space Administration, the National Science Foundation, the Atomic Energy Commission, and other agencies. The conferees ask the Director of the Office of Science and Technology that any changes in those programs be submitted for the approval and action of the Congress.

INCOME TAX REVISIONS IN FAVOR OF FISHERMEN: The Senate on Sept. 10, 1962, passed H.R. 6413, to extend to fishermen the same treatment accorded farmers in relation to estimated income tax, with amendment after adopting committee amendment relating to time for filing declaration of and payment of estimated income tax, and rejecting committee amendment that would have added section respecting limitation on deductions for charitable contributions. Makes it possible for commercial fishermen to file their income tax estimates at the end of the tax year and pay the amount by the following January 15, rather than filing the estimates by April 15 of the same tax year and paying the estimates quarterly during the year. Alternatively, commercial fishermen would have the option of filing returns and paying the taxes on or before February 15 following the close of the tax year.

The House on Sept. 11, 1962, agreed to the Senate amendments to H.R. 6413, therefore clearing the bill for the signature of the President.

The President of the United States, on Sept. 25, 1962, signed H.R. 6413 (P.L. 87-682).

MAINE LOBSTERMAN STATUE: H. Res. 799 (Tupper) introduced in the House on Sept. 12, 1962, making provisions for a statue to "The Maine Lobsterman" in new Southwest Washington, D.C.; referred to the Committee on House Administration.

The House on Sept. 14, 1962, gave unanimous consent that H. Res. 799 be rereferred from the Committee on House Administration to the Committee on the District of Columbia. Subcommittee No. 5 of the Committee on the District of Columbia met Sept. 17, 1962, on the resolution.

The House Committee on the District of Columbia met in executive session Sept. 19, 1962, and ordered reported favorably H.J. Res. 799.

The House on Sept. 20, 1962, received the report (H. Rept. 2446) from the Committee on the District of Columbia on H. Res. 799. Referred to the Committee of the Whole House on the State of the Union.

The House, Sept. 24, 1962, passed H.Res. 799. Resolution asks the National Capital Planning Commission of the District of Columbia to provide for a suitable site for the "Maine Lobsterman Statue," which is to be supplied and erected by the State of Maine. No Senate action required on a House resolution.

NATIONAL FISHERIES CENTER AND AQUARIUM: The Senate, Sept. 21, 1962, passed with amendment H.R. 8181, authorizing construction of a National Fisheries Center and Aquarium in the District of Columbia. Adopted were all committee amendments en bloc, thereafter considered as original text of bill; Miller amendment to provide that such fees shall be charged as will cover costs of construction and of operation of the Center; Miller amendment to limit use of educational and scientific facilities of the Center to those whose nations make such facilities available to United States citizens and with whom the U. S. has diplomatic relations; and a Randolph amendment of a technical corrective nature. A motion by Sen. Morse to recommit the bill to the Committee on Public Works was rejected.

The House on Sept. 24, 1962, received from the Senate H.R. 8181 (amended). Congressman McMillan requested the bill be taken from the Speaker's desk so that the House could concur in the Senate amendments. Congressman Gross objected, therefore, no action was taken on the bill.

NETTING IMPORTS FOR RESEARCH: The Senate on Sept. 12, 1962, insisted on its amendment (adding the text of S. 1814, providing for free importation of monofilament gill nets for use in fish sampling) to H.R. 12180, to provide a temporary suspension of duty on personal and household effects brought into the United States under Government orders, agreed to the conference asked by the House, and appointed conferees.

The House on September 18, 1962, received the conference report (H.Rept. 2413) on H.R. 12180. The Conferees retained the amendment which adds the text of S. 1814.

H. Rept. 2413, Household Effects--Monofilament Gill Fish Nets--Accident and Health Insurance Contract Premiums (Sept. 18, 1962, a report of the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 12180), 4 pp., printed. The Committee of Conference having reached agreement recommended to their respective Houses passage of the bill. Contains statement of the managers on the part of the House and the amendments.

The House on Sept. 21, 1962, adopted the conference report (H.Rept. 2413) on H.R. 12180.

OCEANOGRAPHIC RESEARCH PROGRAM: The Senate on August 29, 1962, received from the House S. 901 amended (passed in lieu of H.R. 12601), to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys, to promote commerce and navigation, to secure the national defense, to expand ocean, coastal, and Great Lakes resources, to authorize the construction of research and survey ships and laboratory facilities, to expedite oceanographic instrumentation, to assure systematic studies of effects of radioactive materials in marine environments, to enchance the public health and general welfare, and for other purposes. The Senate disagreed to the amendments of the House and requested a conference. The following conferees were

appointed for the Senate: Senators Smathers, Engle, Bartlett, Butler, and Keating.

The House on Sept. 14, 1962, insisted on its amendments to S. 901, and asked for a conference. The following conferees were appointed: Dingell, Lennon, MacDonald, Casey, Pelly, Ellsworth, and Morse.

The Committee of Conference, in executive session, Sept. 24, 1962, agreed to file a conference report on the differences between the Senate- and House-passed versions of S. 901.

The House Sept. 27, 1962, received the report (H. Rept. 2493) from the Committee of Conference on S. 901. It is to be cited as the "Oceanographic Act of 1962."

PACIFIC MARINE FISHERIES COMPACT: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Aug. 28, 1962, on H.R. 12205, to consent to the amendment of the Pacific Marine Fisheries Compact and to the participation of certain additional States in such compact in accordance with the terms of such amendment. Alaska, Hawaii, and Idaho will be eligible for membership.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met in executive session Sept. 18, 1962, and ordered reported favorably to the full committee S. 3431.

The House Committee on Merchant Marine and Fisheries met in executive session Sept. 20, 1962, and ordered reported favorably S. 3431.

The House on Sept. 21, 1962, received the report (H. Rept. 2454) on S. 3431: Referred to the Committee of the Whole House on the State of the Union.

POTOMAC RIVER COMPACT (MD. & VA.) OF 1958: The Senate, Sept. 25, 1962, received a report (S. Rept. 2156) from the Committee on the Judiciary without amendment on H. J. Res. 693, granting consent of the Congress to a compact entered into between the State of Maryland and the Commonwealth of Virginia for the creation of the Potomac River Compact of 1958. Gives Maryland and Virginia permission to set up a Potomac River Fisheries Commission. It would regulate through three members from each State the taking of fish and shellfish from the Potomac River between the District of Columbia line and Chesapeake Bay. Research, regulation of fisheries, an oyster inspection fee and licensing would be within the power of the new commission. The compact succeeds an obsolete agreement of 1785, which has been disputed by the States.

The Senate Sept. 27, 1962, passed H.J. Res. 693.

PRICE-QUALITY STABILIZATION: Quality and Price Stabilization (Hearing before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress, 2nd Session, on H.J. Res. 636, H.J. Res. 637, H.J. Res. 639, H.J. Res. 679, H.R. 10335, H.R. 10340, H.R. 10517, H.R. 1127, H.R. 11346, and H.R. 11778, joint resolutions and bills to amend the Federal Trade Commission Act to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes, June 11, 12, 13, 14, 15, 1962), 466 pp., printed. Contains reports of various Federal agencies; statements of various members of Congress and industry people, and statements and communications received from members of industry.

The House Committee on Interstate and Foreign Commerce in executive session, Aug. 30, 1962, ordered favorably reported H.J. Res. 636 (amended), to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes.

The House on September 12, 1962, received the report (H. Rept. No. 2352) from the Committee on Interstate and Foreign Commerce on H. J. Res. 636.

H. Rept. 2352, Quality Stabilization Act (Sept. 12, 1962, Report of the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress, 2nd Session, to accompany H.J. Res. 636), 73 pp., printed. Committee reported joint resolution favorably, with amendments, and recommended passage. Contains explanation of the joint resolution, background information, need for legislation, reports from executive departments and agencies, changes in existing law, and economic consequences.

SALMON DEVELOPMENT PROGRAM IN CALIFORNIA: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Sept. 11, 1962, on H.R. 11343 and identical bills, to direct the Secretary of the Interior to initiate a salmon and steelhead development program in California. Would authorize an anadromous fish development in California. This is based on joint recommendations of the U. S. Fish and Wildlife Service and the California Department of Fish and Game. Existing facilities of the Bureau of Sport Fisheries and Wildlife and the California Department of Fish and Game would be utilized to the fullest extent.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries on Sept. 12, 1962, concluded hearings on H.R. 11343 and related bills.

On Sept. 18, 1962, the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met in executive session and ordered reported favorably to the full committee, amended, H.R. 11343.

SALMON IMPORT RESTRICTIONS: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Sept. 11, 1962, on H.R. 9547, to facilitate the application and operation of the Fish and Wildlife Act of 1956, and for other purposes. Would prohibit the import of salmon products derived from fish caught by nationals of any country that permits fishing for salmon by gill nets on the high seas at times and places where occur large quantities of immature salmon of North American origin.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine

and Fisheries on Sept. 12, 1962, concluded hearings on H.R. 9547. Testimony was heard from Department of the Interior witnesses.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met in executive session on Sept. 18, 1962, and ordered reported favorably to the full committee, amended, H.R. 9547.

The House Committee on Merchant Marine and Fisheries met in executive session, Sept. 27, 1962, and ordered favorably reported as amended H.R. 9547.

SPORT FISH RESEARCH: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Aug. 28, 1962, on H.R. 7826, to authorize and direct the Secretary of the Interior to conduct studies of the genetics of sport fishes and to carry out selective breeding of such fishes to develop strains with inherent attributes valuable in programs of research, fish hatchery production, and management of recreational fishery resources.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: The Senate Committee on Interior and Insular Affairs in executive session, Sept. 5, 1962, ordered favorably reported S. 3019 (amended), to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected is the site of the Bureau of Commercial Fisheries Technological Laboratory at College Park, Maryland.

The Senate on Sept. 7, 1962, received from the Committee on Interior and Insular Affairs the report (S. Rept. No. 2020) on S. 3019 with amendments.

Senate Report No. 2020, Providing for the Conveyance of Certain Real Property of the United States to the State of Maryland (Sept. 7, 1962, Report from the Committee on Interior and Insular Affairs, United States Senate, 87th Congress, 2nd Session, to accompany S. 3019), 4 pp., printed. The Committee reported favorably on the bill with amendments and recommended passage. Contains purpose, need, costs, and Departmental reports.

The Senate on Sept. 12, 1962, passed with amendment S. 3019.

TEXAS RESOURCES AND PROBLEMS: The Report of the U.S. Study Commission - Texas (H. Doc. 494, House of Representatives, 87th Congress, 2nd Session), printed. Part I, The Commission Plan, 209 pp., illus.; Part II, Resources and Problems, 380 pp., illus.; Part III, The Eight Basins, 228 pp., illus.; and Part IV, Summary and Recommendations, 20 pp., illus. This report is the product of a cooperative river basin planning effort conducted under the study commission form of organization. It is a final report (in compliance with Public Law 85-843), in three volumes, on a basic, comprehensive, and integrated plan of development of the land and water resources of the Neches, Trinity, Brazos, Colorado, Guadalupe, San Antonio, Nueces, and San Jacinto River Basins in the State of Texas. In Part I, Chapter 8 (Analysis of Water Problems) devotes a section to fish and wildlife, water pollution control and abatement, and the effect of water resource development on resources of marine bays. Part II, has a chapter on fish, wildlife, and recreation which covers fishery resources, fresh-water fish, and marine fish. Also included in Part II are short sections on propagation of fish and other aquatic life, shellfish culture, and problems in estuaries.

TRADE EXPANSION ACT OF 1962: H. Res. 795 (Boggs) introduced in the House on Sept. 6, 1962, to authorize the printing of a document entitled "Free Trade, Tariff Legislation, and Common Markets for the Western Hemisphere" as a House document and to provide for the printing of additional copies; to the Committee on House Administration.

Senate Finance Committee reported favorably on H.R. 11970, to promote the general welfare, foreign policy, and security of the United States through international trade agreements and through adjustment assistance to domestic industry, agriculture, and labor. Committee approved these additional amendments: Permit President to increase duties or impose other import restrictions; trade adjustment allowances to be paid from Federal funds; permit President to impose import duties or other restrictions on products of countries with restrictions against U.S. agricultural products; on escape clause, redrafted to provide that injury need only result "in major part" of concessions granted and Tariff Commission also to consider inability of a firm to make a reasonable profit; Tariff Commission not required to make industrywide investigation if firm files a petition of adjustment assistance; permit President to negotiate with Great Britain and "Outer Seven" as well as Common Market to reduce tariffs to zero; give President authority to enter into orderly marketing agreements with foreign countries limiting the export of certain articles to the U.S. Another amendment would give the President discretionary authority to withdraw United States concessions from any one country which discriminates against another with resulting injury to the United States. Effort to continue "peril point" defeated; Tariff Commission would make studies of effect of proposed cuts, but would not have to designate a specific "peril point."

The Senate on Sept. 17, 1962, received the report (S. Rept. 2059) from the Committee on Finance on H. R. 11970.

S. Rept. 2059, Trade Expansion Act of 1962 (Sept. 14, 1962, Report from the Committee on Finance, U. S. Senate, 87th Congress, 2nd Session, to accompany H. R. 11970), 40 pp., printed. The Committee reported the bill favorably with amendments and recommended passage of the bill. Contains the purposes of the bill which are: (1) to extend the authority of the President to enter into foreign trade agreements for 5 years from July 1, 1962, through June 30, 1967; (2) to authorize the President to proclaim modifications in or the continuance of existing duties or other import restrictions or such additional import restrictions as he determines to be required or appropriate to carry out such trade agreements; and (3) to authorize adjustment assistance to industries, firms, and groups of workers who may be seriously injured or threatened with serious injury by increased imports resulting from concessions granted in trade agreements. It also contains committee amendments; principal features of the bill as reported; technical explanation of provisions amended; changes in existing law; and comments of Senator Carl T. Curtis.

The Senate on Sept. 18, 1962, worked on H.R. 11970. There were the following actions on amendments:

Adopted: Smathers amendment to language providing that payments of unemployment insurance to adversely-

affected workers shall be disregarded in certain instances where State agency is reimbursed therefor; Pell amendment to allow a special study by Tariff Commission regarding wages paid in foreign supply countries; Bartlett amendment regarding conservation of fishery resources; Bush amendment providing that Tariff Commission shall consider level reasonable profit in tariff adjustments; and Kerr amendment respecting filing with Tariff Commission of petitions for tariff adjustments.

The fishery amendment (Bartlett) states that at a conference on the conservation of international fishery resources the President shall seek to persuade countries whose domestic fishing practices or policies affect such resources, to engage in negotiations on the use or conservation of such resources. Amendment would permit President to increase the tariff rate on fishery products to a rate not more than 50 percent above the rate in effect on July 1, 1934, from any country which fails to engage in negotiations in good faith concerning conservation of fishery resources. This amendment was substituted for the original Bartlett amendment (withdrawn) which provided for the use of import quotas or embargoes for fishery products under certain conditions.

Rejected: By 38 yeas to 40 nays, Bush amendment to restrict the President's tariff-cutting powers by restoring to the bill the peril point provisions of existing law (Mansfield motion to table Dirksen motion to reconsider the vote rejecting this amendment was adopted by 40 yeas to 39 nays); by 13 yeas to 65 nays (motion to reconsider tabled). Curtis amendment to authorize the establishment of a legislative branch committee which, upon disapproval of any raising, lowering, or imposition of new tariff, may recommend congressional action for final decision thereon; by 23 yeas to 5^ nays (motion to reconsider tabled), Curtis amendment to eliminate provision for financial assistance to firms and workers adversely affected by the legislation. Various other amendments were rejected also.

The Senate on Sept. 19, 1962, passed with amendments H.R. 11970. A technical corrective amendment by Senator Mansfield was adopted before the bill was passed. Senate insisted on its amendments, asked for a conference with the House, and appointed the following conferees: Byrd (Va.), Kerr, Long (La.), Smathers, Williams (Del.), Carlson, and Curtis.

The House on Sept. 20, 1962, disagreed to Senate amendment to H.R. 11970. Agreed to a conference requested by the Senate. The following conferees were appointed: Mills, King (Calif.), Boggs, Keogh, Mason, Byrnes (Wisc.), and Baker.

The Committee on Conference, in executive session, Sept. 26, 1962, agreed to file a conference report on the differences between the Senate- and House-passed versions of H.R. 11970.

The House Committee on House Administration, Sept. 26, 1962, met in executive session and ordered reported favorably H. Res. 795, to authorize the printing of a document entitled "Free Trade, Tariff Legislation, and Common Markets for the Western Hemisphere."

TRANSPORTATION ACT OF 1962: The Senate Committee on Commerce on Aug. 24, 1962, continued hearings on S. 3242, to provide for the strengthening and improving the national transportation system, and for other purposes.

The Senate Committee on Commerce resumed hearings Sept. 10-12, and again on Sept. 24-26, 1962, on S. 3242.

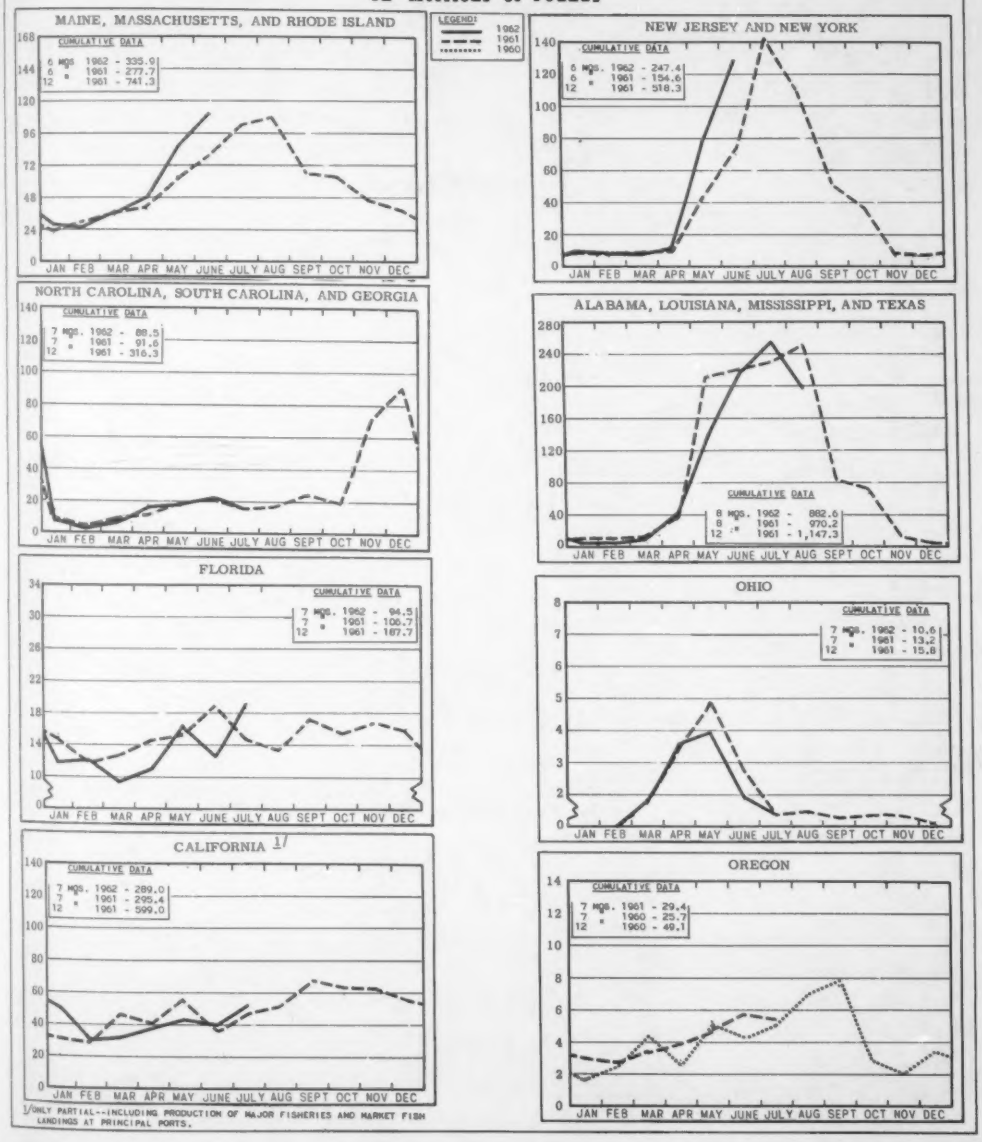
TUNA CONVENTION ACT OF 1950, AMENDMENTS: The Subcommittee on Inter-American Affairs of the House Committee on Foreign Affairs met Aug. 28, 1962, on S. 2568, to amend the act of Sept. 7, 1950, to extend the regulatory authority of the Federal and State agencies concerned under the terms of the Convention for the establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, and for other purposes. The Inter-American Tropical Tuna Commission was originally conceived as an investigatory body. But with recent development of new fishing techniques and gear, namely purse seining with nylon nets and power blocks, the productivity of the U. S. tuna fleet has increased rapidly, particularly as regards yellowfin tuna, and certain conservation regulations are needed. Would provide for the issuance and enforcement of Federal regulations to carry out recommendations of the Commission for the conservation of tuna (especially yellowfin) resources in the eastern Pacific.

The House on Sept. 18, 1962, received the report from the Committee on Foreign Affairs (H. Rept. 2409) on S. 2568 (amended). Referred to the Committee of the Whole House on the State of the Union.

H. Rept. 2409, Conservation of Tropical Tuna (Sept. 18, 1962, report from the Committee on Foreign Affairs, House of Representatives, 87th Congress, 2nd Session, to accompany S. 2568), 24 pp., printed. The Committee reported the bill favorably with amendments and recommended passage. Contains the purpose and need for the bill; generally it will provide the necessary authority to the Secretary of the Interior to issue regulations for controlling the amount of tuna, tuna-like and tuna-bait fish caught in the area, to provide for the imposition of embargoes on tuna caught in violation of the regulations, and to provide various penalties for acts in violation of the regulations; committee action; detailed discussion of the bill; changes in existing law made by the bill; and appendix.

CHART 1 - FISHERY LANDINGS for SELECTED STATES

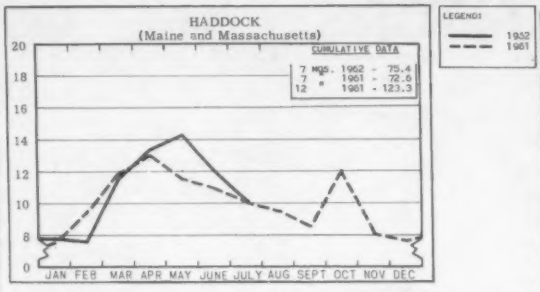
In Millions of Pounds

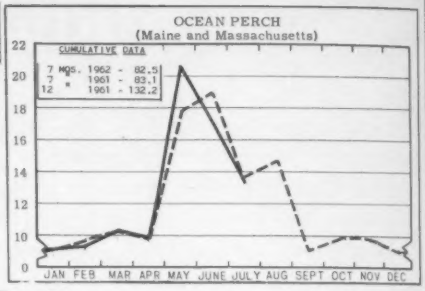

MAINE, MASSACHUSETTS, AND RHODE ISLAND
CUMULATIVE DATA
6 MOS. 1962 - 335.9
6 " 1961 - 277.7
12 " 1961 - 741.3
LEGEND: 1962 1961 1960
NEW JERSEY AND NEW YORK
CUMULATIVE DATA
6 MOS. 1962 - 247.4
6 " 1961 - 154.6
12 " 1961 - 518.3
NORTH CAROLINA, SOUTH CAROLINA, AND GEORGIA
CUMULATIVE DATA
7 MOS. 1962 - 88.5
7 " 1961 - 91.6
12 " 1961 - 316.3
ALABAMA, LOUISIANA, MISSISSIPPI, AND TEXAS
CUMULATIVE DATA
8 MOS. 1962 - 882.6
8 " 1961 - 970.2
12 " 1961 - 1,147.3
FLORIDA
CUMULATIVE DATA
7 MOS. 1962 - 94.5
7 " 1961 - 106.7
12 " 1961 - 167.7
OHIO
CUMULATIVE DATA
7 MOS. 1962 - 10.6
7 " 1961 - 13.2
12 " 1961 - 15.8
CALIFORNIA 1/
CUMULATIVE DATA
7 MOS. 1962 - 289.0
7 " 1961 - 295.4
12 " 1961 - 599.0
OREGON
CUMULATIVE DATA
7 MOS. 1961 - 29.4
7 " 1960 - 25.7
12 " 1960 - 49.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

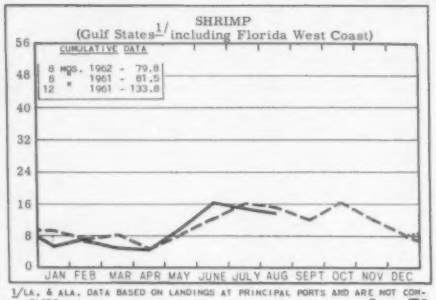
CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

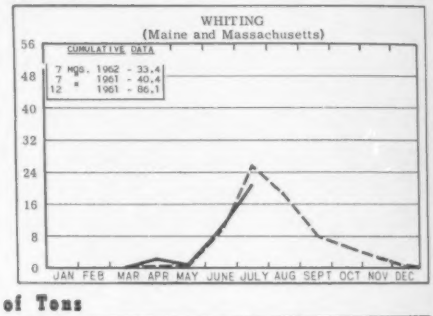



OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
7 MOS. 1962 - 82.5
7 " 1961 - 83.1
12 " 1961 - 132.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

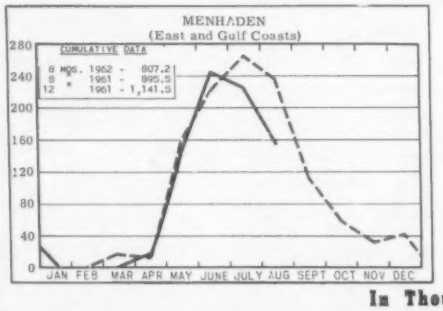
In Millions of Pounds

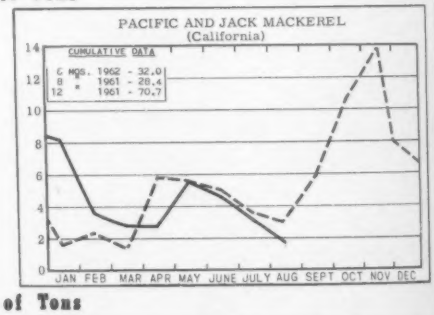

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
8 MOS. 1962 - 79.8
8 " 1961 - 81.5
12 " 1961 - 133.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE

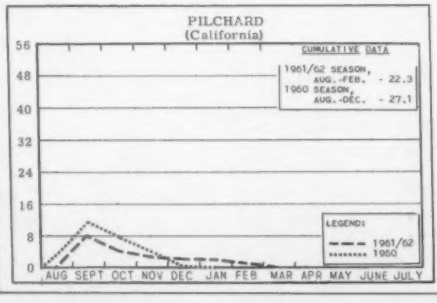

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
7 MOS. 1962 - 33.4
7 " 1961 - 40.4
12 " 1961 - 86.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
8 MOS. 1962 - 807.2
8 " 1961 - 895.5
12 " 1961 - 1,141.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
6 MOS. 1962 - 32.0
8 " 1961 - 28.4
12 " 1961 - 70.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons



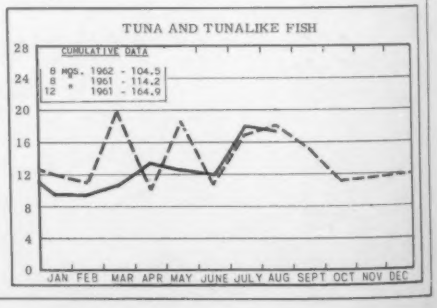
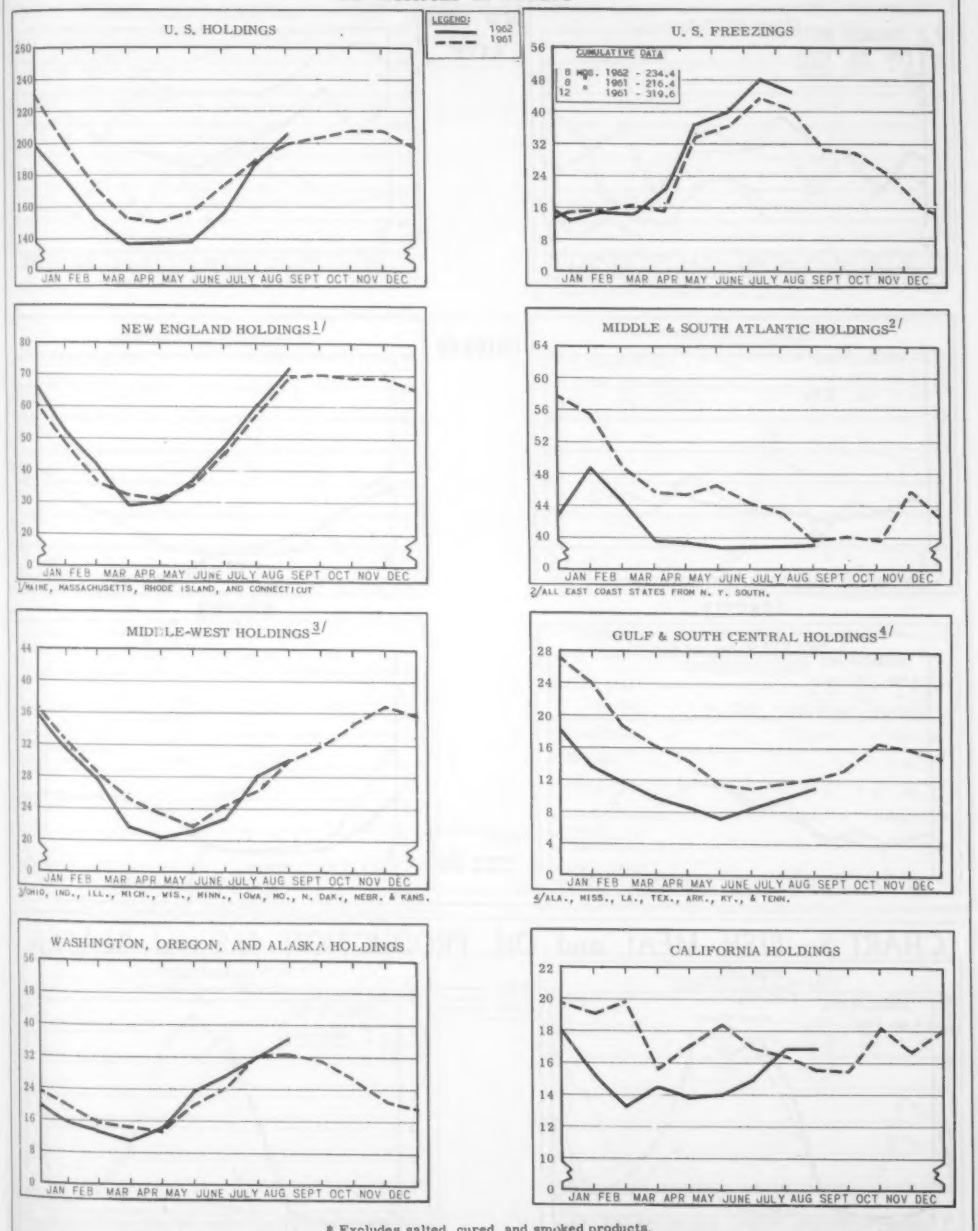

TUNA AND TUNALIKE FISH
CUMULATIVE DATA
8 MOS. 1962 - 104.5
8 " 1961 - 114.2
12 " 1961 - 164.9
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. HOLDINGS
LEGEND: 1962 1961
U. S. FREEZINGS
CUMULATIVE DATA
8 MOS. 1962 - 234.4
8 " 1961 - 216.4
12 " 1961 - 319.6
NEW ENGLAND HOLDINGS 1/
MIDDLE & SOUTH ATLANTIC HOLDINGS 2/
MIDDLE-WEST HOLDINGS 3/
GULF & SOUTH CENTRAL HOLDINGS 4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

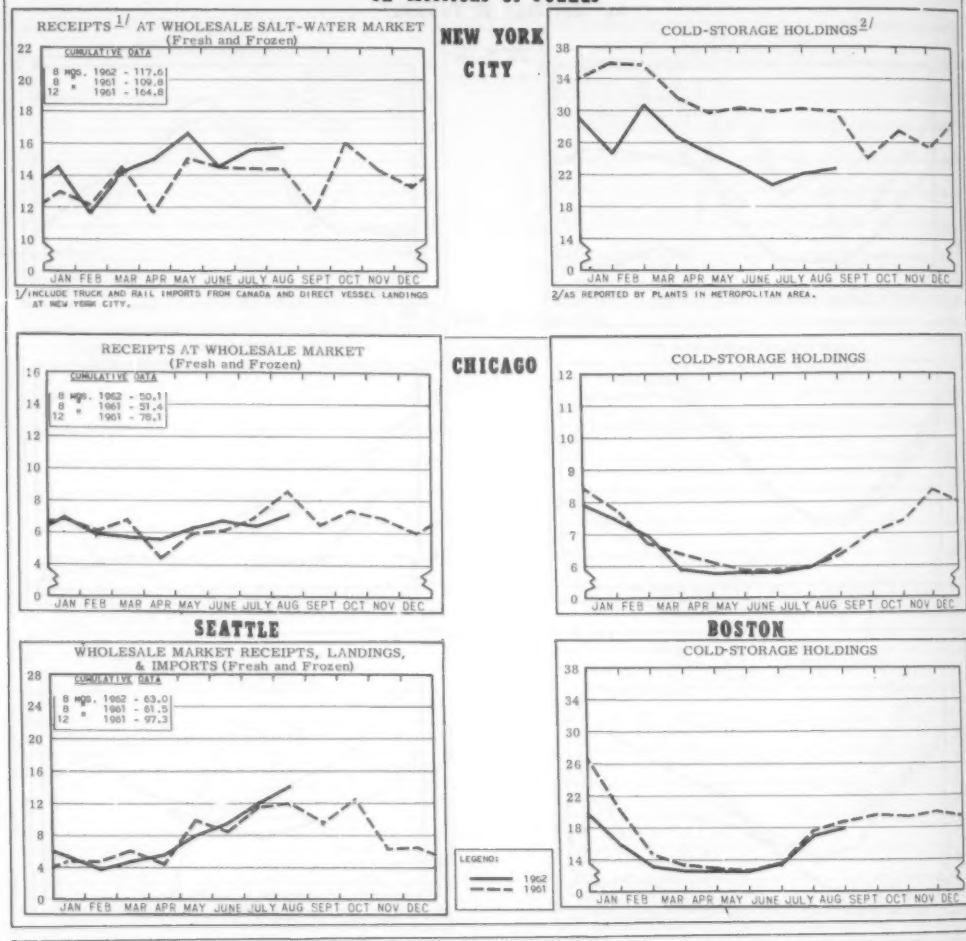
3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds


NEW YORK CITY
RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET (Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1962 - 117.6
8 " 1961 - 109.8
12 " 1961 - 164.8
COLD-STORAGE HOLDINGS 2/
CHICAGO
RECEIPTS AT WHOLESALE MARKET (Fresh and Frozen)
8 MOS. 1962 - 50.1
8 " 1961 - 51.4
12 " 1961 - 78.1
COLD-STORAGE HOLDINGS
SEATTLE
WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (Fresh and Frozen)
8 MOS. 1962 - 63.0
8 " 1961 - 61.5
12 " 1961 - 97.3
BOSTON
COLD-STORAGE HOLDINGS
LEGEND:
1962
1961
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

2/ AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

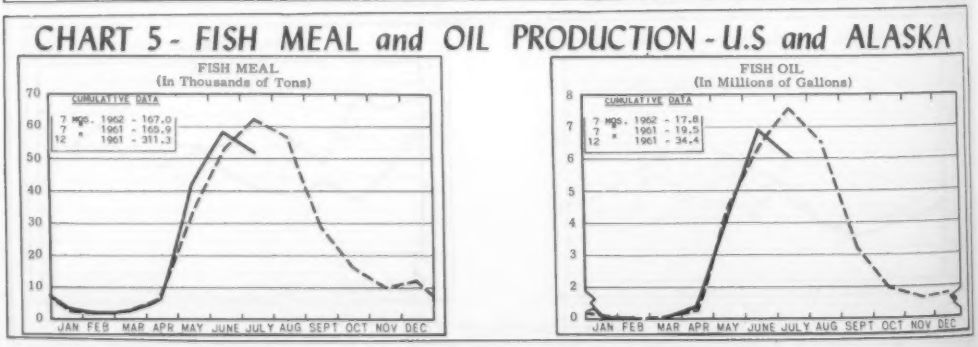
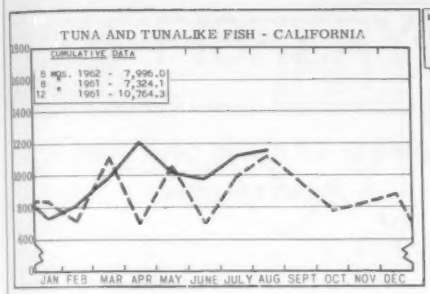
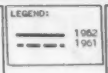
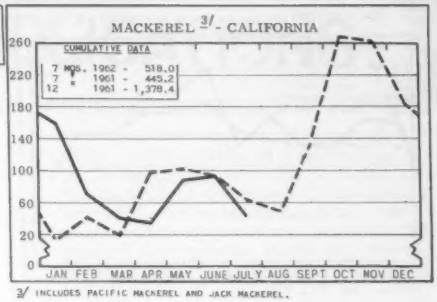

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
7 MOS. 1962 - 167.0
7 " 1961 - 165.9
12 " 1961 - 311.3
FISH OIL
(In Millions of Gallons)
7 MOS. 1962 - 17.8
7 " 1961 - 19.5
12 " 1961 - 34.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

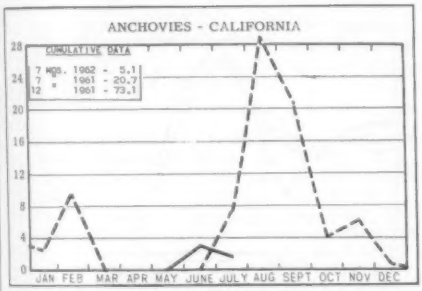
In Thousands of Standard Cases

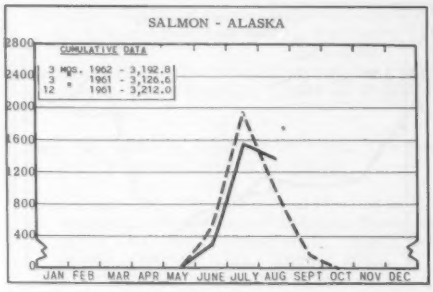

TUNA AND TUNALIKE FISH - CALIFORNIA
CUMULATIVE DATA
5 MOS. 1962 - 7,996.0
6 " 1961 - 7,324.1
12 " 1961 - 10,764.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

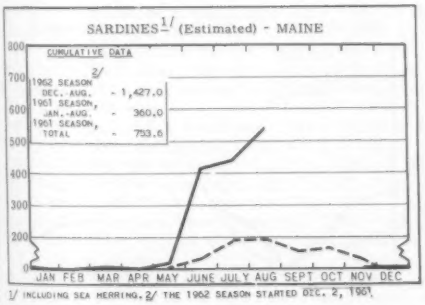



MACKEREL 3/ - CALIFORNIA
CUMULATIVE DATA
7 MOS. 1962 - 518.0
7 " 1961 - 445.2
12 " 1961 - 1,378.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

3/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



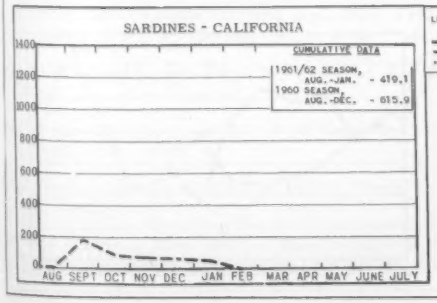


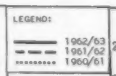

SARDINES 1/ (Estimated) - MAINE
CUMULATIVE DATA
2/
1962 SEASON DEC. AUG. - 1,427.0
1961 SEASON, JAN.-AUG. - 360.0
1961 SEASON, TOTAL - 753.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING. 2/ THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1961/62 SEASON, AUG.-JAN. - 419.1
1960 SEASON, AUG.-DEC. - 615.9
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY



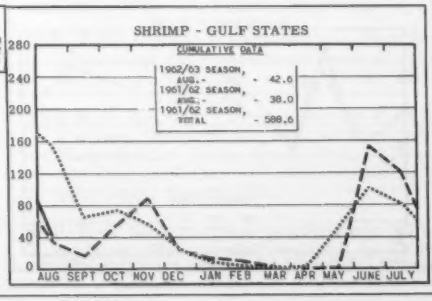
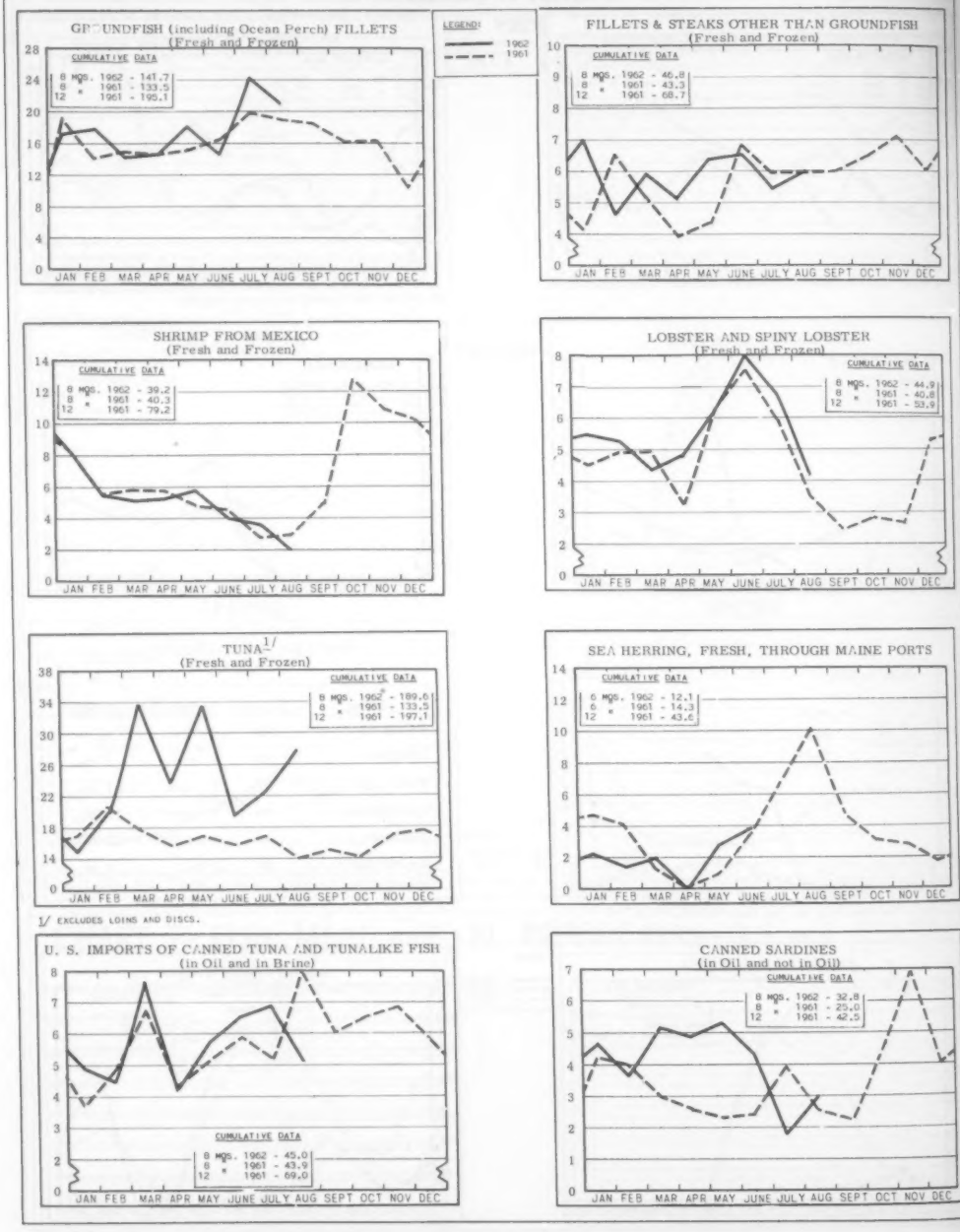

SHRIMP - GULF STATES
CUMULATIVE DATA
1962/63 SEASON, AUG.- - 42.6
1961/62 SEASON, AUG.- - 38.0
1961/62 SEASON, TOTAL - 588.6
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

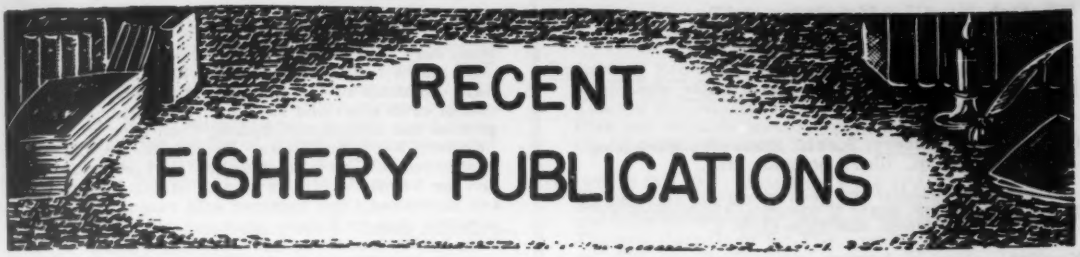
In Millions of Pounds


GROUNDFISH (including Ocean Perch) FILLETS
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1962 - 141.7
8 " 1961 - 133.5
12 " 1961 - 195.1
LEGEND:
1962
1961
FILLETS & STEAKS OTHER THAN GROUNDFISH
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1962 - 46.8
8 " 1961 - 43.3
12 " 1961 - 68.7
SHRIMP FROM MEXICO
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1962 - 39.2
8 " 1961 - 40.3
12 " 1961 - 79.2
LOBSTER AND SPINY LOBSTER
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1962 - 44.9
8 " 1961 - 40.8
12 " 1961 - 53.9
TUNA 1/
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1962 - 189.6
8 " 1961 - 133.5
12 " 1961 - 197.1
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
6 MOS. 1962 - 12.1
6 " 1961 - 14.3
12 " 1961 - 43.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ EXCLUDES LOINS AND DISCS.

U. S. IMPORTS OF CANNED TUNA AND TUNALIKE FISH
(in Oil and in Brine)
CUMULATIVE DATA
8 MOS. 1962 - 45.0
8 " 1961 - 43.9
12 " 1961 - 69.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CANNED SARDINES
(in Oil and not in Oil)
CUMULATIVE DATA
8 MOS. 1962 - 32.8
8 " 1961 - 25.0
12 " 1961 - 42.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number — Title

CFS-2908 - Alabama Landings, April 1962, 3 pp.
CFS-2927 - Maine Landings, April 1962, 4 pp.
CFS-2929 - Wisconsin Landings, April 1962, 2 pp.
CFS-2930 - Michigan Landings, March 1962, 3 pp.
CFS-2931 - Alabama Landings, May 1962, 3 pp.
CFS-2932 - North Carolina Landings, May 1962, 4 pp.
CFS-2934 - New Jersey Landings, May 1962, 4 pp.
CFS-2936 - Mississippi Landings, April 1962, 3 pp.
CFS-2937 - Florida Landings, May 1962, 9 pp.
CFS-2938 - Rhode Island Landings, April 1962, 3 pp.
CFS-2939 - Wisconsin Landings, May 1962, 2 pp.
CFS-2940 - Frozen Fish Report, June 1962, 8 pp.
CFS-2942 - Georgia Landings, May 1962, 2 pp.
CFS-2943 - Fish Meal and Oil, May 1962, 2 pp.
CFS-2944 - Massachusetts Landings, February 1962, 5 pp.
CFS-2945 - Michigan Landings, April 1962, 3 pp.
CFS-2946 - Ohio Landings, May 1962, 2 pp.
CFS-2947 - Maryland Landings, May 1962, 3 pp.
CFS-2948 - Texas Landings, April 1962, 3 pp.
CFS-2949 - New York Landings, May 1962, 4 pp.
CFS-2950 - Virginia Landings, May 1962, 3 pp.
CFS-2951 - Fish Sticks and Portions, April-June 1962, 2 pp.
CFS-2952 - Maine Landings, May 1962, 4 pp.
CFS-2953 - Shrimp Landings, February 1962, 6 pp.
CFS-2956 - North Carolina Landings, June 1962, 3 pp.
CFS-2958 - South Carolina Landings, June 1962, 2 pp.
CFS-2968 - Florida Landings, June 1962, 8 pp.

FL-23 (Revised May 1962) - Earthworms for Bait, 5 pp.

FL-97 (Revised April 1957) - Fish Culture as a Livelihood, 4 pp., 1959.

FL-190 (Revised April 1962) - Turtle Trapping, 9 pp., illus.

FL-359 (Revised June 1961) - Manufacturers of Equipment for the Fish Processing Industries, 12 pp.

FL-533 - Bibliography of Publications of the Branch of Technology, Author Index--1960, compiled by F. Bruce Sanford and Helen E. Plastino, 5 pp., February 1962. Lists in alphabetical order by author's name, publications of the Branch of Technology, Bureau of Commercial Fisheries, Fish and Wildlife Service, for 1960. Indicates where the publications appeared and if reprints are available.

FL-535 - Jellyfishes and Related Animals, by Victor L. Loosanoff, 9 pp., illus., February 1962.

Sep. No. 655 - The Blue Crab and its Fishery in Chesapeake Bay--Part 2 - Types of Gear for Hard Crab Fishing.

Sep. No. 656 - Equipment Note No. 13--Soviet Trawlers Observed in Gulf of Alaska.

SSR-Fish. No. 390 - Seasonal Occurrence of Marine Fishes in Four Shores Habitats Near Beaufort, N. C., 1957-60, by Marlin E. Tagatz and Donnie L. Dudley, 20 pp., illus., August 1961.

SSR-Fish. No. 400 - Tuna Oceanography in the Eastern Tropical Pacific, by Maurice Blackburn, 51 pp., illus., February 1962.

SSR-Fish No. 403 - Attempts to Guide Small Fish with Underwater Sound, by Clifford J. Burner and Harvey L. Moore, 33 pp., illus., February 1962. A summary of attempts to guide fish by means of subaqueous sonic vibrations. The tests were made during November and December 1947 and March and April 1949 at the Biological Station at Leetown, W. Va. The tests were limited to four undersea warfare sound-producing instruments involving three principles of sound production: electromagnetism, Piezoelectricity, and the hydraulic turbine.

SSR-Fish. No. 404 - An Oceanographic Study of the Gulf of Tehuantepec, by Maurice Blackburn, 31 pp., illus., February 1962.

SSR-Fish. No. 408 - Variability in Pink Salmon Escapements Estimated from Surveys on Foot, by William L. Sheridan, 10 pp., illus., March 1962.

SSR-Fish. No. 411 - Distribution of Fish Eggs and Larvae, Temperature, and Salinity in the Georges Bank-Gulf of Maine Area, 1955, by Robert R. Marak, John B. Colton, Jr., and Donald B. Foster, 69 pp., illus., March 1962.

SSR-Fish No. 416 - Marking Sockeye Salmon Scales by Short Periods of Starvation, by Richard L. Major and Donovan R. Craddock, 14 pp., illus., April 1962.

SSR-Fish. No. 417 - Distribution and Seasonal Movements of Saginaw Bay Fishes, by Ira A. Carr, 16 pp., illus., April 1962.

Effects of Pesticides on Fish and Wildlife, Circular 143, 57 pp., illus., printed, 1962.

Outdoor Fish Cookery, Special Fisheries Marketing Bulletin, 24 pp., illus., printed, 1961.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-56	Norwegian Fisheries, 1961
MNL-58	Republic of Korea's Fishing Industry, 1961.
MNL-73	Red Sea Fishery Off Massawa, Ethiopia.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, June 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and by provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, June 1962, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Products and Byproducts Brokers and Importers, 1962 (Partial List, as Revised July 1, 1962), SP List 1, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) Contains the names and addresses of primary receivers of various types of imported fishery products and byproducts in the Los Angeles, San Diego, San Francisco, and Oakland areas.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, June 1962, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

English Translations of Pacific Salmon Literature (A Preliminary List), compiled by Paul T. Macy, 24 pp., processed. Literature Research Unit, U. S. Bureau of Commercial Fisheries, Biological Laboratory, 2725 Montlake Blvd., Seattle 2, Wash., March 20, 1961.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, June 1962 and July 1962, 21 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--April 1962, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1962, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

The Story of the Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Massachusetts, by Paul S. Galtsoff, Circular 145, 124 pp., illus., printed, May 25, 1962. (Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.) A historical sketch of the Woods Hole Biological Laboratory, and the part Spencer Fullerton Baird, the first Commissioner of Fisheries, played in the establishment of the first marine biological station in

the United States. It discusses the scientific and marine investigations undertaken in the formative years, and gives a general outline of the research projects carried out in the laboratory and the more important contributions during the years 1887-1951. In addition to its function as a fishery research center for the North Atlantic area, in 1951 the Laboratory became the center of United States research activities sponsored by the International Commission for the Northwest Atlantic Fisheries.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, AT THE INDICATED OFFICES:

101 TERMINAL ISLAND, CALIFORNIA.

The Study on the Color of the Fishing Net. I--Observations on the Passage of Fishes Through a Colored Net, by Kenji Kanda and Atushi Koike, Translation Series No. 1, 6 pp., processed. (Translated from the Japanese Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 10, 1958, pp. 612-616, printed.

P. O. BOX 3830, HONOLULU, HAWAII.

The Basic Types of Vertical Distribution of Copepods in the Central Pacific Ocean, by A. K. Heinrich, 6 pp., illus., processed. (Translated from the Russian Doklady Akademii Nauk SSSR, vol. 132, no. 4, 1960, pp. 921-924.)

The Horizontal Distribution of Copepods in the Central Pacific and the Factors Determining It, by A. K. Heinrich, 14 pp., illus., processed. (Translated from the Russian Trudy Instituta Okeanologii, vol. 41, 1960, pp. 31-41.)

The Surface Plankton of the Central Pacific, by A. K. Heinrich, 8 pp., illus., processed. (Translated from the Russian Trudy Instituta Okeanologii, vol. 41, 1960, pp. 42-47.)

FISHERY TECHNOLOGICAL LABORATORY
2725 MONTLAKE BLVD., SEATTLE 2, WASH.

Carbonyl Compounds in Fish as Related to the Deterioration. II--Thermal Production of Formaldehyde in Fish Flesh, by Fuyuo Ota, 8 pp., processed. (Translated from the Japanese Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 5, 1958, pp. 338-341.)

Rusting of Fish Products and Its Prevention, by Junsaku Nonaka, 21 pp., processed. (Translated from the Japanese Yushi Kagaku Kyokaishi, vol. 7, no. 5, 1958, pp. 317-322.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Determining Age of Young Haddock from Their Scales, by Albert C. Jensen and John P. Wise, Fishery Bulletin 195 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 439-450, illus., printed, 15 cents, 1962.

Development, Distribution, and Comparison of Rudder Fishes (KYPHOSUS SECTATRIX, Linnaeus, and K. INCISOR, Cuvier) in the Western North Atlantic, by Donald Moore, Fishery Bulletin 196 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 451-480, illus., printed, 30 cents, 1962.

Estimating Red Salmon Escapements by Sample Counts from Observation Towers, by Clarence Dale Becker, Fishery Bulletin 192 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 355-369, illus., printed, 20 cents, 1962.

Growth of the Adult Male King Crab (PARALITHODES CAMTSCHATICA, Tilesius), by Douglas D. Weber and Takashi Miyahara, Fishery Bulletin 200 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62), pp. 53-75, illus., printed, 25 cents, 1962.

Influence of Early Maturing Females on Reproductive Potential of Columbia River Blueback Salmon (ONCORHYNCHUS NERKA), by Richard L. Major and Donovan R. Craddock, Fishery Bulletin 194 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 429-437, illus., printed, 15 cents, 1962.

Propagation and Distribution of Food Fishes for the Calender Years 1959 and 1960, Statistical Digest 52, 48 pp., printed, 1962, 20 cents.

Raft Culture of Oysters in Massachusetts, by William N. Shaw, Fishery Bulletin 197 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 481-495, illus., printed, 20 cents, 1962. Discusses an experiment to test the possibility of growing oysters attached to rafts as a method of culture that might be useful in reviving the declining oyster industry. Describes the area involved in the experiment as to temperature, salinity, oxygen content, and pH of the water and aquatic life in the river; construction of the raft; origin of oysters used; assembling the strings of oysters; and determining the shell growth and oyster mortality. Includes also an analysis of results of shell growth rate; effects of temperature, fouling, and spawning on growth; and mortality and practical aspects of raft culture. The experiment demonstrates that raft culture is commercially feasible in Massachusetts.

Rearing Tilapia for Tuna Bait, by Thomas S. Hida, Joseph R. Harada, and Joseph E. King, Fishery Bulletin 198 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62), pp. 1-20, illus., printed, 20 cents, 1962. Discusses the hatchery rearing of Tilapia mossambica in 1958 and 1959 at Paia, Maui, to determine if tilapia could be produced economically to supplement the supply of naturally-occurring bait fish. A description of the hatchery and its operation and the results obtained are presented. Discusses environmental conditions, chemical determinations, stocking the brooding tanks, feeding schedules, collecting the fry, and production and mortality of the young. Also discusses production of bait-size tilapia, 1958-1959; acclimatization of tilapia to sea water; utilization of tilapia as bait; and production costs.

Studies on PARORCHIS ACANTHUS (Trematoda: Digenea) as a Biological Control for the Southern Oyster Drill, THAIS HAEMASTOMA, by Nelson R. Cooley, Fishery Bulletin 201 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 62), pp. 77-91, illus., printed, 20 cents, 1962.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADRIATIC FISH:

Kvantitativno-Kvalitativna Analiza Ribljih Naselja Kanala Srednjeg Jadrana (Quantitative-Qualitative Analysis of the Fish Populations in the Channels of the Adriatic), by S. Zupanovic, Acta Adriatica, vol. 9, no. 3, 1961, 151 pp., illus., printed in Serbo-Croatian with summary in French. Institut za Oceanografiju i Ribartstvo, Split, FNR, Yugoslavia.

Novi Podaci o Maksimalnim Duzinama Nekih Jadranskih Riba (New Data on Maximum Length of Certain Adriatic Fish), by Fabjan Grubisic, Biljeske-Notes, no. 14, 1959, 8 pp., printed in Serbo-Croatian with summary in French. Institut za Oceanografiju i Ribarstvo, Split, FNR, Yugoslavia.

Prilog Poznavanju Biologije Jadranskih Riba CHONDRICHTHYES (Contribution to the Knowledge of the Biology of Adriatic Fish), by S. Zupanovic, Acta Adriatica, vol. 9, no. 4, 1961, 84 pp., illus., printed in Serbo-Croatian with summary in French. Institut za Oceanografiju i Ribarstov, Split, FNR, Yugoslavia.

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Marine Algae From the Tropical Atlantic Ocean. V--Algae From the Lesser Antilles, by William Randolph Taylor, 21 pp., illus., printed. (Reprinted from Contributions from the United States National Herbarium, vol. 36, part 2, pp. 43-62.) U. S. National Museum, Smithsonian Institution, Washington, D.C., 1962.

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ANCHOVETA:

Artificial Fertilization of the Eggs, and Rearing and Identification of the Larvae of the Anchoveta, CETENGRAULIS MYSTICETUS, by Edward F. Klima, Izadore Barrett, and John E. Kinnear, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 4, 1962, 26 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif. Discusses results of a study to identify anchoveta, an important bait fish used to capture tunas in the Eastern Tropical Pacific Ocean, from the time of hatching to about 25 mm. Describes the artificial fertilization of anchoveta eggs; and rearing of planktonic eggs and larvae. Also covers examination of field collections of anchovy larvae made shortly before, during and immediately after the anchoveta spawning season, to identify and separate the anchoveta larvae from the larvae of other anchovies, using meristic, morphometric, and anatomical characteristics.

Fecundity of the Anchoveta (CETENGRAULIS MYSTICETUS) in the Gulf of Panama, by Clifford L. Peterson, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 2, 1961, 14 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

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"Effects of Tetracycline Antibiotics on the Products of Anserinase Action in Chill Stored Haddock (Gadus aeglefinus) Muscle," by B. Sanz Perez and N. R. Jones, article, Journal of Food Science, vol. 27, no. 1, January-February 1962, pp. 69-72, illus., printed. Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

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"The Effects of Erosion, Silt, and other Inert Materials on Aquatic Life" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by J. Wilson, Technical Report W60-3, pp. 269-271, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

BARENTS SEA:

The Results of Surveys on Young Cod and Haddock in the Barents Sea During the Period 1946-1959, by A. S. Baranenkova, 13 pp., processed. (Translated from the Russian Soviet Fisheries Investigations in North European Seas, 1960, pp. 267-275.) Ministry of Agriculture, Fisheries, and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1961.

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Informacos Sobre a Pesca Maritima no Nordeste Brasileiro--Estados do Maranhao a Bahia (Information on the Maritime Fish of North Brazil--States of Maranhao and Bahia), by Rui Simoes de Menezes, 20 pp., processed in Portuguese. Assessor de Pesca do Governo do Estado da Bahia, Caixa Postal, 1, 366, Bahia, Brazil, 1960.

CALIFORNIA:

California Fish and Game, vol. 48, no. 3, July 1962, pp. 151-211, illus., printed, single copy 75 cents. Department of Fish and Game, Printing Division,

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Documents Section, Sacramento 14, Calif. Includes, among others, the following articles: "Catch Records from the Striped Bass Sportfishery in California," by Harold K. Chadwick; "The 1960 Preseason Albacore Survey in the Northeastern Pacific Ocean," by William L. Craig and Robert H. Caneday; "The Electrophoretic Characteristics of Albacore, Bluefin Tuna, and Kelp Bass Eye Lens Proteins," by Albert C. Smith; and "An Unusual Catch of a Large Number of Pacific Round Herring Off Long Beach, California," by John G. Carlisle, Jr.

CANADA:
Progress Reports of the Pacific Coast Stations, no. 114, 35 pp., illus., printed, 35 Canadian cents. Fisheries Research Board of Canada, Ottawa, Canada, June 1962. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.) Includes, among others, the following articles: "Packaging Air Shipments of Fresh Fish," by F. G. Claggett; "A New Method for Unloading Fish," by S. W. Roach and J. S. M. Harrison; "Abalones in British Columbia," by D. B. Quayle; "Pollution in Coastal Waters of British Columbia," by Michael Waldichuk; and "Frozen Albacore Tuna--The Influence of Storage Conditions Prior to Freezing," by N. Tomlinson, Shirley E. Geiger, and Eve Roberts.

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Marine Biology in China During the Past Decade, by Tseng Ch'eng-K'wei, OTS No. 60-11, 776, 13 pp., processed, 50 cents, June 26, 1960. Technical Services, U. S. Department of Commerce, Washington 25, D. C.

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"The Female Reproductive Cycle of the Crayfish Cambarellus shufeldti: The Influence of Environmental Factors," by Mildred Eileen Lowe, article, Tulane Studies in Zoology, vol. 8, no. 6, July 14, 1961, pp. 157-176, illus., printed. Tulane University, New Orleans, La.

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DEMERSAL FISH:
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DENMARK:
Journal du Conseil, vol. 27, no. 2, May 1962, pp., 119-216, illus., printed, single copy Kr. 16 (about US$2.35). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. (Available from Messrs. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.) Includes, among others, these articles: "The Use of Electronic Sector-Scanning Sonar for Following the Movements of Fish Shoals: Sea Trials on R.R.S. Discovery II," by F. R. Harden Jones and B. S. McCartney; "The Influence of Wind and Tide on the Catch by Drift Nets in the East Anglian Herring Fishery 1952-1956," by G. C. Bolster; "On the Correlation Between the Arrival and Spawning of the Norwegian Winter Herring," by Olav Aasen; "Reactions of Larval and Young Salmonids to Water of Low Oxygen Concentration," by H. M. Bishai; and "Reactions of Larval and Young Salmonids to Different Hydrogen Ion Concentrations," by H. M. Bishai.

DEPRECIATION RULES:
Depreciation Guidelines and Rules, Publications No. 456 (7-62), 59 pp., printed, 25 cents. U. S. Treasury Department, Internal Revenue Service, Washington, D. C., July 1962. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The new Procedure, Revenue Procedure 62-21, provides basic reforms in the guideline lives for depreciation and in the administration of depreciation for tax purposes. It sets forth simpler standards and more objective rules which will facilitate adoption of rapid equipment replacement practices in keeping with current and prospective economic conditions. The new Procedure consists of 3 parts. Part I contains the new guidelines for depreciation which set forth the guideline classes and lives. Parts II and III, intended basically for use by accountants and lawyers, include the administrative procedures, and illustrative Reserve Ratio and Adjustment of Class-Life Tables and detailed instructions for their use. Also includes a group of questions and answers concerning some specific inquiries which may arise.

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"Keep Out Fish Electrically," by R. E. Dodson, article, American City, vol. 76, no. 2, pp. 95-96, printed. American City Magazine Corp., 470 Fourth Ave., New York 16, N. Y.

EUROPEAN COMMON MARKET:
Agricultural Commodities and the European Common Market (13 FAO Commodity Policy Studies), CCP 62/8, 69 pp., printed, $1.00. Food and Agriculture Organization of the United Nations, Commodities Division, Viale delle Terme di Caracalla, Rome, Italy, 1962. The purpose of this study is to provide information and some preliminary analysis with respect to the role of major agricultural commodities under the provisions of the Treaty of Rome of 1957 which created the European Common Market, and proposals under consideration for putting these provisions into effect. Includes an assessment of the possible effects of the establishment of the European Common Market on the agricultural trade of the rest of the world. Also discusses the possible consequences of the entry of the United Kingdom and the associa-

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tion of Commonwealth countries. Although fishery products and fisheries are not specifically covered, some of the general concepts may also be applicable to fisheries.

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"A Device for Feeding Brine Shrimp to Fishes," by John G. VanDerwalker and Edward Chin, article, Transactions of the American Fisheries Society, vol. 91, no. 2, 1962, pp. 230-231, illus., printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

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FISH ODORS:
"Speculations on Fishy Odors and Flavors," by M. E. Stansby, article, Food Technology, vol. 16, no. 4, 1962, pp. 28-32, printed. Garrard Press, 510 North Hickory, Champaign, Ill.

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A Study of the Upstream Passage of Anadromous Fish at Willamette Falls, with Recommendations for Improvements in Fish-Passage Facilities, by Harlan B. Holmes and Milo C. Bell, 233 pp., illus., processed. Oregon Fish Commission, 307 State Office Bldg., Portland, Oreg., 1960.

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Mathematical Model of the Fish Population Considering the Change of the Availability, by Ichiro Yamanaka, Bulletin of the Japan Sea Regional Fisheries Research Laboratory No. 8, 97 pp., illus., printed in Japanese with English abstract. Japan Sea Regional Fisheries Research Laboratory, Niigata, Japan, March 1961.

"O Formakh Prisposoblenii k Samoregulyatsii Chislennosti Populyatsii u Ryb." (Types of Adaptation to Self-Regulation of Population Size in Fish), by G. V. Nikol'skii. Biological Abstracts, vol. 36, no. 23, 1961, abst. no. 79139, printed. University of Pennsylvania, 3815 Walnut St., Philadelphia 4, Pa.

FISH STORAGE:
"Post-Rigor Changes in Nitrogen Distribution and Texture of Fish During Storage in Crushed Ice," by M. N. Moorjani and others, article, Food Technology, vol. 16, no. 2, February 1962, pp. 80-84, printed. The Garrard Press, 510 No. Hickory St., Champaign, Ill.

FOOD AND AGRICULTURE ORGANIZATION:
Multilingual Vocabulary and Notation for Fishery Dynamics, by S. J. Holt, 42 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1959.

Proceedings of the World Scientific Meeting on the Biology of Sardines and Related Species (Meeting held in Rome 14-21, September 1959), edited by H. Rosa, Jr. and Garth Murphy, vols. I, II, and III, 1,403 pp., illus., processed in English with summaries in French and Spanish. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1960. The objectives of the meeting were to appraise the status of knowledge on certain major aspects of the biology of sardines and related species, to examine and appraise the methods in research being used in the study of these aspects, and to indicate the lines along which national and international action might be developed, with a view to obtaining improvement in the methods and development of the research programs. The discussions exposed many problems, especially with regard to terminology, the study of the vulnerability and accessibility of stocks, and the identification of population units and measurements. The three volumes present the texts of contributed documents and the results of these discussions.

World Fisheries Abstracts, List of Periodicals Searched as at 31 December 1959, Supplement to vol. 12, no. 1, 11 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

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FOODS:

Practical Food Microbiology and Technology, by Harry H. Weiser, 355 pp., illus., printed, $11 in U. S. and $12 foreign. The AVI Publishing Co., Inc., Westport, Conn., 1962. To emphasize a few basic concepts that are related to some of the biochemical changes induced by microorganisms from a practical viewpoint in processing certain foods is the purpose of this book. The preface points out that "obviously the composition of foods will influence the kind and nature of biochemical changes caused by microorganisms in food." Food spoilage is discussed with emphasis on appropriate control measures. Food additives, including antibiotics, are stressed because they are legally used in some cases while in other instances they may be detrimental. The role of radiation in food technology is explained and discussed. Food poisoning is emphasized because it is on the increase in spite of the sanitary measures taken at the present time. A discussion on sources and treatment of water supplies is stressed. But no attempt is made to list microbial standards for raw and processed foods because that information is available from various sources. The chapters on food and man, composition of foods, and enzymes should be of interest to any food processor or handler. Fish and fishery products are mentioned in several places. The chapter on microbiology of meats discusses briefly the preservation of fish (including icing, salting, smoking, freezing, and canning); microbiology of fish, shellfish meats, and shellfish meat products; microbiology of oysters and shellfish; inspection of oysters for harmful organisms; propagation of oysters; public aspects of oyster production; purification of oysters; survival of enteric organisms in shellfish; the biology of oysters; public health significance of paralytic shellfish poison. Since more and more of the fishery products are being packed in advanced forms of processing, this book should be of interest to processors, buyers, sellers, and users of fishery products.

--Joseph Pileggi

Symposium on Foods: Lipids and Their Oxidation, Editor, H. W. Schultz, Assistant Editors--E. A. Day and R. O. Sinnhuber, 452 pp., illus., printed, $3 in U. S., $3.50 foreign (includes packing). The AVI Publishing Co., Inc., Westport, Conn., 1962. The present knowledge of oxidative deterioration of lipids, particularly as related to foods, is reviewed and appraised in this book. It contains the 21 papers presented by international authorities at the second biennial Symposium on Foods arranged by the Department of Food and Dairy Technology, Oregon State University, in September 1961. Discussions which followed each of the papers are also included to provide additional information. To focus the attention of scientists on the acceptability and toxicological implications of oxidation of lipids in natural and prepared foods was the purpose of the meeting. The book is made up of 22 chapters divided into five sections. The first chapter and section introduces the subject of oxidative deterioration of food lipids. The other sections cover mechanisms and products of lipid oxidation; factors affecting lipid oxidation (includes a chapter on high-energy irradiation); autoxidation in foods (includes a chapter on marine products); biological significance of autoxidized lipids (includes a chapter on nutritional effects and thermally polymerized fish oils). The chapter on marine products points out that "fish products are more rapidly oxidized and the reactions are more complicated than those of other foods, mainly because the kinds of fatty acids present are more highly unsaturated and more numerous." The chapter discusses fresh fish, cooked fish, frozen fish, freeze-dried fish, fish meal, fish oils, and the use of antioxidants in fish products. Of course, the book is an excellent reference work for use by all persons interested in lipids of foods generally, but anyone interested in fishery products and byproducts also will find it useful. The National Institutes of Health provided financial assistance not only for conducting the symposium, which is the basis of the book; but also for making it possible to sell the book at below the usual price.

--Joseph Pileggi

FOOD SANITATION:

General Principles of Food Sanitation, FDA Publication No. 16, 22 pp., illus., printed. (Reprinted from Microscopic-Analytical Methods of Food and Drug Control, Food and Drug Technical Bulletin No. 1, pp. 7-27.) Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington 25, D. C. The first two chapters of Technical Bulletin No. 1 attempt to show the place of sanitation in good commercial production and to outline the general principles of factory and product control. The reprint can assist administrative and sanitation personnel in understanding basic concepts of sanitation.

FREEZING:

"Freezing on Board Fishing-Boats," by G. Giannesi, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 382-392, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

GERMAN FEDERAL REPUBLIC:

Versuche zur Fangausweitung durch Anderung der Fangtechnik, 1958/59 (Experiments on Increasing the Catch by Variation of the Catch Technique, 1958/59), by A. v.Brandt and others, 64 pp., illus., processed in German. (Reprinted from Protokolle zur Fischereitechnik, vol. 6, no. 25, September 1959.) Institut fur Netz und Materialforschung, Bundesforschungsanstalt fur Fischerei, Hamburg, Germany.

Versuche zur Fangausweitung durch Andefung der Fangtechnik, 1959/60 (Experiments on Increasing the Catch by Variation of the Catch Technique, 1959/60), 140 pp., illus., processed in German. (Reprinted from Protokolle zur Fischereitechnik, vol. 6, no. 27/28, April 1960, pp. 156-295.) Institut fur Netz und Materialforschung, Bundesforschungsanstalt fur Fischerei, Hamburg, Germany.

GIBRALTER:

Erlauterungen zur Bathymetrischen Karte der Strasse von Gibralter (Explanations on the Bathymetric Map of the Strait of Gibralter), by Gunter Giermann, Bulletin de l'Institut Oceanographique Nos. 1218A and

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1218B, 31 pp., and 5 charts, printed in German with French and English summaries. Musee Oceanographique, Monaco-Ville, Monaco, October 30, 1961.

GRAYLINGS:
Sistematika i Ekologija Lipljena Jugoslavije (The Systematics and Ecology of Graylings, Thymallus thymallus L., in Yugoslavia), by Draga Jankovic, 148 pp., illus., printed in Serbo-Croatian with English summary, Biological Institute, Belgrade, Yugoslavia, 1960.

GREAT LAKES:
"Our Stake in the Great Lakes Fisheries," by John R. Greeley, article, The Conservationist, vol. 16, no. 3, December-January 1961-62, pp. 14-15, illus., printed, single copy 50 cents. The Conservationist, Room 335, State Campus, Albany, N. Y.

HAKE:
"Analysis Bromatologico Comparativo en Merluza (MERLUCCIUS GAYI) Entera y Eviscerada (Comparative Analysis of Composition of Hake, Merluccius gayi, Whole and Eviscerated), by Omar Rojas J. and Berta Lorca P., Divulgacion Pesquera Cartilla No. 4, 22 pp., illus., processed. Departamento de Pesca y Caza, Ministerio de Agricultura, Direccion de Agricultura y Pesca, Santiago, Chile, June 1962.

HALIBUT:
"Movement of Tagged Halibut Off New England--II," by Albert C. Jensen and John P. Wise, article, Transactions of the American Fisheries Society, vol. 90, no. 4, 1961, pp. 489-490, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

HERRING:
Growth and Recruitment in the Herring of the Southern North Sea. I, by A. C. Burd; and Recruitment to the North Sea Herring Stocks. II, by D. H. Cushing, Fishery Investigations Series II, vol. 23, no. 5, 1962, 73 pp., illus., printed, $4.50. Ministry of Agriculture, Fisheries and Food, London, England. (For sale by British Information Services, 45 Rockefeller Plaza, New York 20, N. Y.) The purpose of Part I is to show that the general pattern of the biology of the southern North Sea herring is dependent on their growth rate, and also that southern North Sea herring recruit to the adult stock at a given length, the Critical Length, irrespective of age. It discusses the distribution and the growth rates of the Downs and Bank herring stocks; the adult broods and recruit age groups of the East Anglican distributions; relationship between Calanus--preferred food of the herring--and herring growth; and recruitment to East Anglia. Part II discusses two patterns of recruitment--the prewar pattern and the post-1952 pattern; the effect of available food on recruitment; and related information. Extensive statistical data are also included.

Herring (Selected Articles from Soviet Periodicals), 158 pp., illus., printed, $1.50. The Israel Program for Scientific Translations, Jerusalem, 1961. (For sale by the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.) Contains translations of articles on herring, as follows: "Some Factors Determining the Abundance of Clupeidae," by A. N. Svetovidov; "Herring of the Barents Sea," by Z. A. Borodatova; "The Catches of Small Kandalaksha Herring in Spring 1929," by I. M. Germasimov; "The Herring with Low Vertebral Count (Clupea harengus pallasi Val.) of the Barents and Kara Seas," by V. K. Esipov; "The Reproduction and Life-Cycle of the Murman Herring (Clupea harengus harengus L.)," by T. S. Rass; "Morphophysiological Characters of the Kara Sea Herring," by M. E. Makushok; "The Abundance of South Sakhalin Herring," by A. N. Probatov; "Biology of Foraging Herring Inhabiting the Waters of Southwestern Kamchatka and the Northern Kuril Islands," by I. A. Piskunov; "Distribution and Abundance of Spawning Herring Near the Eastern Coasts of the Sea of Japan," by A. N. Probatov.

ICES Herring Tagging Experiments in 1957 and 1958, by Olav Aasen and others, Rapports et Proces-Verbaux des Reunions, vol. 152, September 1961, 50 pp., illus., printed, Kr.15 (about US$2.20). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark.

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Fisheries of Maharashtra, 25 pp., illus., printed. Department of Fisheries, Government of Maharashtra, Sachivalaya, Bombay-32, India, April 1961.

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"Damage to Fish by Industrial Waste Waters," by W. Schmassmann, article, Beseitigung und Reinigung, pp. 60-71, printed in German. Beseitigung und Reinigung industrieller Abwasser, R. Oldenbourg, Munich, Germany.

INSECTICIDES:
"Aerial Forest Spraying in Canada in Relation to Effects on Aquatic Life" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by F. E. Webb, Technical Report W60-3, pp. 66-70, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Bio-Assays to Determine the Toxicity of Pesticides to Aquatic Invertebrates," by A. R. Gaufin, article, Proceedings of the 15th Industrial Waste Conference, No. 106, pp. 94-98, printed. Engineering Extension Service, Purdue University, Lafayette, Ind.

"Effects of Forest Insect Spraying on Trout and Aquatic Insects in some Montana Streams" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1951), by R. J. Graham, Technical Report W60-3, pp. 62-65, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Effects on Young Salmon of Forest Spraying with DDT" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by C. J. Kerswill and others, Technical Report W60-3, p. 71, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Herbicides" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by C. R. Walker, Technical Report W60-3, p. 272, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

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"The Retention of DDT by Trout and Whitefish" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by O. B. Cope, Technical Report W60-3, pp. 72-75, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

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The Government-Industry Cooperative Oyster Research Program. Part I--History and Methodology, by Amihud Kramer and others, 14 pp., illus., printed. (Reprinted from the Journal of the Association of Official Agricultural Chemists, vol. 45, no. 2, May 1962.) Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C. This is the first of four parts of the final report of the Government-Industry Cooperative Oyster Research Program (GICORP), sponsored jointly by the Fish and Wildlife Service, the Food and Drug Administration, and the Oyster Institute of North America. GICORP was organized for the purpose of establishing the composition of the oyster in its "native" state, and the changes that occur as a result of processing, packing, and marketing. Discusses the objectives of GICORP, definition of oyster identity, and chemical, physical, and physiological methods to measure oyster identity.

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"Packaging of Freeze-Drieds," by T. C. Taylor, article, Food Engineering, vol. 33, no. 9, September 1961, pp. 41-44, illus., printed. Food Engineering, Chilton Co., Chestnut and 58th Sts., Philadelphia 39, Pa. Gives a comprehensive survey of packaging materials, such as cans, cartons, and flexible pouches, single and laminated, used and being developed by many producers of freeze-dried foods. Containers should be capable of offering physical protection to

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fragile and brittle products and of maintaining oxygen level below 2 percent and moisture content below 3 percent. Where products are extremely sensitive to enzymatic activity, lower levels are essential and inpackage desiccants can be used. Most producers use nitrogen to flush the container before inserting the freeze-dried food.

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Importancia Economica de la Pesqueria en El Quinquenio: 1957-1961 (Economic Importance of the Fishing Industry for the Years 1957-1961), by Javier Iparraguirre Cortez, 118 pp., illus., printed in Spanish. Ministerio de Agricultura, Servicio de Pesqueria, Lima, Peru.

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An Ecological Survey of a Scottish Herring Fishery. Part III--Geographical and Ecological Groups in the Plankton, by R. S. Glover, G. A. Cooper, and D. C. T. Forsyth; Part IV--Changes in the Plankton During the Period 1949 to 1959, by M. H. Williamson; Appendix: A Method for Studying the Relation of Plankton Variations to Hydrography, by M. H. Williamson, 36 pp., illus., printed, 9 s. (about U.S.$1.26). (Reprinted from Bulletins of Marine Ecology, vol. 5, nos. 47-48, December 1961, pp. 195-229.) Officer in Charge, Oceanographic Laboratory, 78 Craighall Rd., Edinburgh 5, Scotland.

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Zooplankton in Relation to Herring in the Norwegian Sea, June 1959, by Ulf Lie, 12 pp., illus., printed. (Reprinted from Fiskeridirektoratets Skrifter, Serie Havundersokelser, vol. 13, no. 1.) Fiskeridirektoratet, Bergen, Norway, 1961.

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Management of Artificial Lakes and Ponds, by George W. Bennett, 300 pp., illus., printed, $8. Reinhold Publishing Corporation, 430 Park Ave., New York 22, N. Y., 1962. The author has included the most recent scientific advances and practical techniques in artificial lake and pond management. For those interested in a comprehensive and integrated presentation of the dynamics and management of warm-water fish populations in artificial lakes and ponds, this is just the book. Students, researchers, and professional workers will find that the development of the subject is broad in scope, and well suited to their needs. The foreword interestingly points out that "Much of man's activity, either indirectly or directly, is aimed at manipulating populations." Among the examples cited is the work going on in the Great Lakes area of North America where man wishes to increase the numbers of lake trout and at the same time destroy the sea lamprey, a trout predator. The change from the "art" of management to the "science" of management is a new phenomenon which has appeared within the present century. In my opinion, the author has attempted and succeeded in bringing together and giving meaning to fish management knowledge which has been hidden in the literature and has had no meaning to the non-specialist. Specific directions, such as, for example, how to stock a lake, have been avoided. The book shows the range of reasonable stocking and its relationship to the range of potential results. A brief and concise view of fish culture is presented first. Next, artificial aquatic habitats are distinguished from natural bodies of water, are described, and categorized as much as possible. This is followed by an examination of the ecological interrelationships of fish and lake habitats and a discussion of the implications for the professional manager. Then there is a fairly thorough treatment of such large concepts as carrying capacity, productivity, growth, reproduction, competition, and predation. After discussing the theory and techniques of management, the complex problems of fishing mortality and natural mortality are taken up. The last few chapters deal with sensory perception and behavior in sport fishing and its commercial aspects. Technical terminology has been reduced to a minimum and the mathematical approach to population dynamics has been left to a listing of papers on the subject. The text of the book does not show the scientific names of the fish mentioned; however, the scientific names and the common names of all the fish mentioned appear in the Appendix. The book has a good index, and is well documented. Pond owners, professional fishery biologists, limnologists, conservation workers, government fishery experts and administrators, fishermen, and students of aquatic biology and fishery management will find the book of considerable interest and value.

--Joseph Pileggi

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printed. Department of Scientific and Industrial Research, P. O. Box 8018, Government Building, Wellington C.I., New Zealand.

Local Stocks of Autumn Chum Salmon in the Amur Basin, by I. Birman, Translation Series No. 349, 22 pp., processed. (Translated from the Russian Voprosy Ikhtiologii, no. 7, 1956, pp. 158-173.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

Local Stocks of Summer KETA, ONCORHYNCHUS KETA (Walbaum), of the Amur Basin, by A. Svetovidova, Translation Series No. 347, 16 pp., illus., processed. (Translated from the Russian Voprosy Ikhtiologii, no. 17, 1961, pp. 14-23.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

Marine Tagging of Fraser River Sockeye Salmon, by L. A. Verhoeven and E. B. Davidoff, Bulletin XIII, 132 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B.C., Canada, 1962.

The Stocks of West Kamchatka Salmon and Their Commercial Utilization, by R. Semko, Translation Series no. 288, 131 pp., illus., processed. (Translated from the Russian Zapadnokamchatskikh lososei i ikh promyslovoe ispol zovanie.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1960.

SARDINES:

"La Peche a la Sardine sur les Cotes Francaises de Mediterranee" (Sardine Fishing Along the French Mediterranean Coasts), by L. Zali, article, La Peche Maritime, vol. 41, no. 1011, June 1962, pp. 414-418, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

Sur Une Alteration des Caracteristiques d'Age des Populations de Sardine Pechees au Nord du Portugal (On the Change in Age Characteristics of Sardine Populations Fished in Northern Portugal), by J. Amorim Machado-Cruz, Publicacoes do Instituto de Zoologia No. 73, 13 pp., illus., printed in French. (Reprinted from Anais da Faculdade de Ciencias do Porto, vol. XLIII.) Instituto de Zoologia, Faculdade de Ciencias do Porto, 108 Rua Formosa, Porto, Portugal, 1960.

SCALLOPS:

"Giant Scallops in Newfoundland Coastal Waters," by H. J. Squires, Bulletin of the Fisheries Research Board of Canada No. 135, 29 pp., printed, 50 Canadian cents. Fisheries Research Board of Canada, Ottawa, Canada, 1962. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.)

Gulf of St. Lawrence Scallop Explorations, 1961, by N. Bourne and A. McIver, Circular No. 35, 4 pp., printed. Fisheries Research Board of Canada, Biological Station, St. Andrews, N.B., Canada, 1962.

SHARKS:

"What You Should Know About Sharks (Part 2)," by Ednard Waldo, article, Louisiana Conservationist, vol. 14, nos. 7-8, July-August 1962, pp. 6-8, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. This is the second part of an article on sharks. Describes primarily the characteristics of sharks' teeth. Discusses variations of teeth found in different species, power of the teeth and how this power is used as a weapon for attack and defense, citing several examples. Also lists the common species of sharks, giving their common and scientific names, and their maximum sizes.

SHRIMP:

Dados Sobre Modificacao do Peso do Camarao, Provocada Pelo Metodo de Conservacao Empregado no Entreposto de Pesca de Cananeia (Data on Changes of Weight in the Shrimp Induced by a Conservation Method Used at the Fishery Rearing Station of Cananeia), by Victor Sadowski and Alexandre Radasewski, no. 147, 5 pp., illus., processed in Portuguese. (Reprinted from Universidade de Sao Paulo Contribuicoes Avulsas do Instituto Oceanografico, Tecnologia No. 1, 1960.) Universidade de Sao Paulo, Instituto Oceanografico, Sao Paulo, Brazil, 1960.

"Shrimp Fleet Blessing--Colorful Louisiana Ceremony," by Jack Britt, article, Louisiana Conservationist, vol. 14, nos. 7-8, July-August 1962, pp. 12-13, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

Use of Stains in Shrimp Mark-Recapture Experiments, by T. J. Costello, Contribution no. 23, 5 pp., printed. International Commission for the Northwest Atlantic Fisheries, Forrest Bldg., Carleton St., Halifax, Nova Scotia, Canada. Paper presented at the ICNAF North Atlantic Fish Marking Symposium, May 1961.

SMALL BUSINESS MANAGEMENT:

Electric Motor Maintenance for Small Plants, Technical Aids No. 80, 4 pp., printed. Small Business Administration, Washington 25, D. C. The common causes of electric motor trouble are identified and some of the ways to keep electric motors running are discussed. Electric motors, like any other equipment, can only be maintained economically when they are fitted for the service they are expected to perform. Whether AC or DC motors are selected to run the machinery, they must be properly applied and correctly installed. Only then can proper maintenance reduce the chances of motor failure and the accompanying costs in repairs.

Problems and Prospects of South Carolina Food Processors, by Olin S. Pugh, Robert L. King, and W. F. Putman, Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C., April 1962. A summary of a report on problems and prospects of South Carolina food processors. The findings of the report represent extensive research in the over-all aspects of food processing in South Carolina. Besides providing a factual analysis of the State's food processing industries, the study aimed to determine the managing, marketing, and operating problems of the eight major categories of the food and kindred products industries, how they were being resolved, and what the future prospects were.

Sound Objectives Help Build Profits, Management Aids No. 142, by T. Stanley Gallager. 4 pp., printed. Small

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Business Administration, Washington 25, D. C. A report on how sound objectives help build profits. It discusses the desirability of formulating and formalizing company goals, as well as the continuing need for reviewing such objectives in order to keep them current and sound. By setting up specific business objectives, small businessmen can provide their organizations with an efficient blueprint to guide company progress in an orderly manner. By reviewing objectives periodically, small businessmen can learn: (1) whether their objectives need to be adjusted, and (2) what, if any, policy and procedure changes are needed in order to achieve current goals.

SNAPPER:

The Shark Bay Fishery on Snapper (CHRYSOPHRYS UNICOLOR), by B. K. Bowen, Report I, 18 pp., illus., printed. Fisheries Department, 108 Adelaide Terrace, Perth, Australia, 1961.

SOUTH AFRICA REPUBLIC:

Fishing Industry Research Institute (Fourteenth Annual Report of the Director, 1 January-31 December 1960), 47 pp., illus., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, South Africa. Discusses part played by the Fishing Industry Research Institute of Cape Town in solving factory production problems and in research on the scientific background to fish processing. Outlines investigations undertaken by the Institute on fresh and frozen fish; salted and dried fish; fish canning; fish sausage; use of fish flour as the basis for new food products; fish meal; and stickwater recovery. The primary emphasis of research was on fish meal and fish oils; variation of fish meal composition during production; moisture distribution vs. particle size of fish meals; methods of estimating the digestibility of fish meals; available lysine in fish meal; oxidation of fish oils; drying of fish oils with silica gel; and apparatus for spontaneous heating tests. Also discusses routine chemical and bacteriological analyses as well as routine investigations on frozen fish; frozen rock lobster tails for export; canned fish and rock lobster; fish meal sampling and supervision of loading; fish meal bags; and tomato paste.

Index to the Publications of the Fishing Industry Research for the First Ten Years 1947-1957, by J. S. Dunn, 63 pp., printed. Fishery Industry Research Institute, Cape Town, South Africa Republic, 1958.

SOUTH DAKOTA:

Fishes of South Dakota, by Reeve M. Bailey and Marvin O. Allum, 131 pp., illus., printed, $2.50. University of Michigan, Museum of Zoology, Ann Arbor, Mich. It gives a short history of South Dakota ichthyology, collecting stations, and annotated list of fish.

SPAIN:

Sobre Algunos Peces Poco Frecuentes o Desconocidos en la Costa Vasca (On Some Rare and Unknown Fish on the Basque Coast), by Jose Mari Navaz y Sanz, Publication No. 14, 57 pp., illus., printed in Spanish. Sociedad de Oceanografia de Guipuzcoa, San Sebastian, Spain, 1961.

SPINY LOBSTERS:

"The Freezing of Spiny Lobster Tails," by J. Deniel and J. Nouy, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 402-412, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

"On the Occurrence of the Spiny Lobster, Panulirus dasypus (H. Milne-Edwards) in Bombay Waters, with a Note on the Systematics of Bombay Lobsters," by B. F. Chhapgar and S. K. Deshmukh, article, Journal of the Bombay Natural History Society, vol. 58, no. 3, December 1961, pp. 632-638, illus., printed. Bombay Natural History Society, 91 Walkeshwar Rd., Bombay 6, India.

STANDARDS:

Index to Microscopic-Analytical Methods in Food and Drug Control, Food and Drug Technical Bulletin No. 1, 14 pp., printed. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington 25, D. C., 1962. An index to Technical Bulletin No. 1, entitled "Microscopic-Analytical Methods in Food and Drug Control," which discusses the latest methods for microscopic identification of contaminants in foods and drugs and is designed to help analysts trace adulterants to their sources

STURGEON:

The Lake Sturgeon, by W. J. K. Harkness and J. R. Dymond, illus., printed. The Ontario Department of Lands and Forests, Toronto, Ontario, Canada. This account of the lake sturgeon covers distribution, habits, food, growth, reproduction, artificial propagation, fishing methods, the fishery itself, and conservation of the species. The largest lake sturgeon of which there is authentic record weighed 310 pounds. It was caught in Batchewana Bay, Lake Superior, in 1922, and a more recent fish of the same weight was caught in Lake Michigan in 1943. Each was nearly eight feet long. Larger ones are reported to have been taken in earlier times, but their weight cannot be authenticated. The lake sturgeon has much larger relatives; a white Oregon sturgeon taken in the Columbia River was 12.5 feet long and weighed 1,285 pounds. Prejudice against eating sturgeon seems to have been based partly on the fact that many people did not know how to prepare it, although French Canadians are said to have used it for bouillon and also to have pickled it. Much of the low opinion of the species, however, was based on its destructiveness to nets and worthlessness as a commercial fish as well as to the belief that it was destructive to more valuable food fish. It was the practice of smoking sturgeon and the use of their roe in making caviar that led to an active demand, and by 1880 the sturgeon fishery had become an important branch of the fishing industry.

TEXAS:

A Checklist of Texas Fresh-Water Fishes, by Clark Hubbs, IF Series-No. 3, 12 pp., printed. Division of Inland Fisheries, Texas Game and Fish Commission, Austin, Tex., revised December 1958.

TEXTURE OF FISH:

"Development of an Instrument for Evaluating Texture of Fishery Products," by John A. Dassow, Lynne

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

G. McKee, and Richard W. Nelson, article, Food Technology, vol. 16, no. 3, 1962, pp. 108-110, illus., printed. Garrard Press, 510 North Hickory, Champaign, Ill.

THAWING:

"Application of Centrifugal Method for Measuring Shrinkage During the Thawing and Heating of Frozen Cod Fillets," by D. Miyauchi, article, Food Technology, vol. 16, no. 1, January 1962, pp. 70-72, illus., printed. Garrard Press, 510 No. Hickory St., Champaign, Ill.

"Das Dielektrische Auftauen Schnellgefrorener Lebensmittel" (Dielectric Thawing of Frozen Foodstuffs), by O. Lang, article, Die Kalte, vol. 41, no. 10, November 1961, pp. 615-618, illus., printed in German. Hans A. Keune Verlag, Pressehaus, I Speersort, Hamburg 1, Germany.

TRAWLERS:

In Defense of Certain Conditions in the Designing of Fishing Trawlers, by E. Muragin, O.N.I. Translation No. 852, 9 pp., processed. (Translated from the Russian Rybnoe Khoziaistvo, vol. 11, 1960, pp. 27-33.) Office of Naval Intelligence, Translations Section, Washington 25, D. C.

"Lord Nelson, First British Trawler with Partial Freezing, has an Aft Ramp," by M.B.F. Ranken, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 393-397, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

TRAWLING:

Our Observation on the Behavior of the Trawl in Water, by N. A. Lyapin, OTS60-51080, 6 pp., illus., processed, 50 cents. (Translated from the Russian Rybnoe Khoziaistvo, vol. 35, no. 2, 1959, pp. 43-46.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"Treuils de Manoeuvre de Chalut a Entrainement Electrique ou Electro-Hydraulique des Chantiers Seebeck" (Tests of Trawl Operated by Electrical or Hydraulic-Electrical Device of the Seebeck Shipyard), article, La Peche Maritime, vol. 41, no. 1011, June 1962, pp. 446-447, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

TRAWL NETS:

Trawl Mesh Regulation in the Strait of Georgia, by K. S. Ketchen, Circular No. 61, 16 pp., printed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

TROUT:

"Physical Characteristics and Chemical Composition of Two Subspecies of Lake Trout," by Claude E. Thurston, article, Journal of the Fisheries Research Board of Canada, vol. 19, no. 1, 1962, pp. 39-44, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

TUNA:

"Fundamental Studies on the Prevention of Discolouration of Frozen Yellow-Fin Tuna Meat," by K. Tanaka, article, Refrigeration, vol. 36, no. 409, November 1961, pp. 1-17, printed. Japanese Association of Refrigeration, Kenchiku Kaikan Bldg., 3-1 Ginza Nishi, Chuo-ku, Tokyo, Japan.

Measures of Population Density and Concentration of Fishing Effort for Yellowfin and Skipjack Tuna in the Eastern Tropical Pacific Ocean, 1951-1959, by Thomas P. Calkins, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 3, 1961, 84 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif. The primary objective of this study is to compute two indices of population density and an index of concentration of fishing effort of tuna bait boats for skipjack alone and for yellowfin and skipjack combined, and to examine the quarterly and annual variations in these indices. Secondary objectives are to examine the relationship between these indices and the dispersal of the fishery, and to demonstrate the seasonal changes in the geographical distribution of the catch-per-unit-of-effort in the skipjack fishery. The report discusses the source and routine processing of data, and the calculation of the indices. Then for skipjack alone and for yellowfin and skipjack combined, it discusses the quarterly variations in the indices of density and index of concentration; relationship between weighted and unweighted indices of density. For skipjack, the report analyzes the seasonal changes in the geographical distribution of catch-per-standardized-day's-fishing.

La Peche du Thon a la Longue-Ligne--Ses Possibilites dans les Eaux Voisines de la Nouvelle-Caledonie (Tuna Long-Line Fishing--Its Possibilities in the Neighboring Waters of New Caledonia), by Michel Angot and Rene Criou, 31 pp., illus., processed in French. Office de la Recherche Scientifique et Technique Outre-Mer, 20, rue Monsieur, Paris 7e, France, September 1959.

"La Peche du Thon a Madagascar," Tuna Fishing in Madagascar), by A. Crosnier and P. Fourmanoir, article, Bulletin de Madagascar, vol. 11, no. 185, October 1961, pp. 867-891, illus., printed in French. M. le Directeur de l'Imprimerie Nationale, Tananarive, Madagascar.

Possibilites de Peche Artisanale du Thon en Nouvelle-Caledonie (Possibilities for a Tuna Fishery in New Caledonia), by R. Criou, 26 pp., illus., processed in French. Office de la Recherche Scientifique et Technique Outre-Mer, 20, rue Monsieur, Paris 7e, France, June 1959.

A Review of Present Knowledge Relative to a Possible Tuna Fishery in New Zealand, by M. K. McKenzie, Fisheries Technical Report No. 4, 49 pp., illus., processed. New Zealand Marine Department, Wellington, New Zealand, 1962. Discusses the biology of the main species of tuna found in New Zealand, their size, distribution, season, and fishing methods used; exploratory cruises made to locate tuna concentrations; recent work done in oceanography in the Tasman Sea and coastal waters of New Zealand; and tuna boats and fishing gear. Includes also figures charting the probable distribution of the tuna species below the surface of the sea, as well as data on water temperatures. The author says northern bluefin

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is known to occur in New Zealand, striped tuna occurs in spring and autumn in the northern half of the North Island, yellowfin occurs in the summer in northern latitudes, albacore in the summer and autumn in the North Island, and southern bluefin in the spring and autumn.

Spawning of Yellowfin Tuna and Skipjack in the Eastern Tropical Pacific, as Inferred from Studies of Gonad Development, by Craig J. Orange, Inter-American Tropical Tuna Commission Bulletin, vol. 5, no. 6, 1961, 68 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

Tuna Fishing in Australia and Its Possible Application in New Zealand, by W. G. Sampson, Fisheries Technical Report No. 5, 43 pp., illus., processed. New Zealand Marine Department, Wellington, New Zealand, 1962. Discusses Australian tuna clippers, their fundamental requirements and special equipment; live bait tanks and holding pens, their construction and equipment; methods of capture and care of live bait fish; searching and fishing for tuna; and handling and storage of tuna on board ship. Includes illustrations of equipment used and structural and miscellaneous details on Australian tuna vessels (pole fishing).

Tuntsy i drugie ob'ekty tuntsovogo promysla (Tunas and Other Objects of the Tuna Fishery), by V. L. Zharov, Iu. L. Karpechenko, and G. V. Martinsen, 114 pp., illus., printed in Russian, 49 kop. (about 60 U.S. cents). VNIRO Glavniproekta, pri Gosplanie, SSSR, Moscow, U.S.S.R., 1961. The book consists of two sections entitled: "The Description of Tunas and other Objects of the Tuna Fishery" and "The Catch Statistics of the Objects of the Tuna Fishery." The following groups of fish are considered by the authors to be the objects of the tuna fishery: scombroids (tunas and mackerel-like fish), the billfish and the barracouta. Identification keys for various groups of fish are scattered throughout the book. Each species is illustrated by a text figure. The brief description of each species includes information on the following: common names in various languages, synonymy, size, habits, geographical distribution, methods of capture, economical importance, as well as the form in which the species is utilized. The statistical portion of the book contains information on the catch of various fish dealt with in the first section, containing tabulations with a world-wide coverage for the catch of various countries for the years 1938 and 1947 through 1958.

--W. L. Klawe, Senior Scientist,
Inter-American Tropical Tuna Commission

Year Class Abundance, Mortality and Yield-Per-Recruit of Yellowfin Tuna in the Eastern Pacific Ocean, 1954-1959, by Richard C. Hennemuth, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 1, 1961, 51 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 10, no. 5-6, May-June 1962, 31 pp., illus., printed in Turkish with English table of contents. Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, the following articles: "Oils Utilized in Canned Fish Industry and Their Standardization;" "Main Features of Fishery Financing in Japan;" "Tuna Long-Line Fishing at Marmara and Preparations of the Materials;" and "Seasonings Utilized in Preparations of Fish Products."

UNITED KINGDOM:

Scottish Sea Fisheries Statistical Tables, 1961, 50 pp., printed, 5s. 6d. (about 76 U.S. cents). Department of Agriculture and Fisheries for Scotland, St. Andrew's House, Edinburgh 1, Scotland, 1962. (Available from Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland.) Contains 27 statistical tables showing quantity and value of fish landed and processed, number of vessels and fishermen, and creek returns. Tables 1 through 19 cover quantity and value of fish landed in the United Kingdom and Scotland by British and foreign vessels; landings of British vessels according to methods of fishing, 1938-1961; quantity and value of each kind of fish landed in each district by various types of British vessels; quantity of each kind of fish landed by foreign vessels from each fishing region; and quantity and value of fish landed by foreign vessels by each nationality. They also cover seasonal landings of herring fishing; quantity of each kind of fish landed from and expenditure of fishing effort in each fishing region; and quantity and value of each kind of fish landed by British vessels, 1913, 1938, and 1954-1961. Tables 20 through 22 show quantity and value of processed fish, including herring and white fish. Tables 23 through 26 show fishing vessels by type and district; fishermen employed; and greatest number of vessels and persons employed in the herring fishery. The last table gives data on the number of vessels and fishermen and quantity and value of fish landed in creeks.

Sea Fisheries Statistical Tables, 1961, 44 pp., printed, 5s. (about 70 U.S. cents). Ministry of Agriculture, Fisheries and Food, London, England, 1962. (Available from Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.) Consists of statistical data showing the quantity, value, and average value of fish and shellfish landed in England and Wales by species, region, and method of capture. The different kinds of fish are divided into three main groups: demersal, pelagic, and shellfish. Also includes data on number of fishermen and fishing vessels employed as well as quantity and value of exports and imports, 1960-1961, by kinds and countries.

White Fish Authority, Annual Report and Accounts for the Year Ended 31st March 1962, 57 pp., printed, 3s. 6d. (about 50 U.S. cents). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England. Discusses the activities and functions of the White Fish Authority for the fiscal year ending March 31, 1962, its income, expenditures, and fishery loans. Includes sections on production of fishery products; marketing and distribution; research and experiments undertaken; training courses for fishermen; and investigations into the costs and earnings of inshore fishermen. Also includes statistical tables on distribution of trawlers; rebuilding of fleets; interest rates charged by the Authority on loans; and a summary of white fish imports.

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UNITED STATES GOVERNMENT:

United States Government Organization Manual, 1962-63, 766 pp., illus., printed, $1.50. Office of the Federal Register, National Archives and Records Service, Washington, D. C., June 1, 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) The official organization handbook of the Federal Government. Contains sections descriptive of the agencies in the legislative, judicial, and executive branches. Supplemental information includes brief descriptions of quasi-official agencies, selected multilateral international organizations, selected bilateral organizations, charts of the more complex agencies, and appendices relating to abolished and transferred agencies, and to governmental publications. Also describes the agencies connected with fisheries: U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife.

U.S.S.R.:

The Pre-Conventional Fishing (Japanese and Russian Fisheries), English translations of fishery literature, miscellaneous series no. 322, 39 pp., processed. U. S. Department of the Interior Library, Washington 25, D. C.

Results of Three Years of Observations on Fish Below the Lenin Hydroelectric Station on the Volga, by A. Diuzhikov, Translation Series No. 363, 16 pp., processed. (Translated from the Russian Voprosy Ikhtiologii, vol. 1, no. 1(18), 1961, pp. 69-78.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

Some Theoretical Results of Investigations by the Murmansk Biological Station. The Hydrological, Hydrochemical and Biological Features of the Region Investigated, by M. M. Kamshilov, 18 pp., processed. (Translated from the Russian Regular Features of the Concentration and Migrations of Commercial Fishes in the Coastal Zone of Murman, 1958, pp. 259-269.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1961.

VESSELS:

"Refrigerated Ship Tavriya for the Freezing and Transport of Fish," by L. R. Kozyrchuk and E. C. Yusupov, article, Sudostroenie, vol. 27, no. 3, 1961, pp. 1-3, illus., printed in Russian. Soviet Ministrov SSSR, Sudpromgiz, Suvorooski, Leningrad S-15, U.S.S.R.

WEATHER CHARTS:

Coastal Warning Facilities Chart, Hawaiian Islands, 1962, 2 pp., processed, 10 cents. Weather Bureau, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The chart shows stations displaying small craft, gale, whole gale, and hurricane warnings, explanation of warning displays and schedules of AM and FM radio and TV stations that broadcast weather forecasts and warnings.

Small Craft, Gale and Whole Gale Warning Facilities Chart, Great Lakes: Huron, Erie, and Ontario, 1962, 2 pp., processed, 10 cents. Weather Bureau, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This chart shows stations displaying small craft, gale, whole gale, and hurricane warnings, explanation of warning displays, and schedules of AM and FM radio and TV stations that broadcast weather forecasts and warnings.

WHALES:

The Biology and Hunting of Beluga or White Whales in the Canadian Arctic, by D. E. Sergeant, Circular No. 8, 15 pp., printed. Fisheries Research Board of Canada, Arctic Unit, Montreal, Canada, 1962.

The Biology of the Pilot or Pothead Whale in Newfoundland Waters, by D. E. Sargeant, Bulletin No. 132, printed, C$1. Fisheries Research Board of Canada, Ottawa, Canada. (For sale by the Queen's Printer and Controller of Stationery, Ottawa, Canada.)

Whales and Dolphins of the Canadian East Coast, by D. E. Sargeant, Circular No. 7, 27 pp., printed. Fisheries Research Board of Canada, Arctic Unit, Montreal, Canada, 1961.

WHALING:

International Whaling Statistics, no. XLVII, 77 pp., printed, Kr. 2.00 (about 28 U.S. cents). The Committee for Whaling Statistics, Oslo, Norway, 1962. A report on the results of the whaling operations in the Antarctic during the season 1959/60 and on grounds outside the Antarctic in the calendar year 1960. Includes statistical tables on whaling in the Antarctic; whaling operations of Norway, the United Kingdom, Japan, and the U.S.S.R.; whaling results for various other countries; average size of whales caught; and whales caught by species, sex, and size. Also includes data on average production of oil per "blue-whale equivalent;" average production of oil per sperm-whale; and whale foetuses measured.

"New Whaling Fleet in Venture off British Columbia Coast," by Bruce Woodland, article, Trade News, vol. 14, no. 12, June 1962, pp. 7-8, illus., printed. Department of Fisheries, Ottawa, Canada. Describes the revival of whaling on Canada's west coast with the departure of British Columbia's largest-ever whaling fleet. The sailing was the first since 1959, when the Pacific Coast industry halted whaling operations because of poor markets.

WORLD TRADE:

The following World Trade Information Service Report, published by the Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C., is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C., at 10 cents a copy.

Licensing and Exchange Controls, Australia, Operations Report No. 62-36, WTIS Part 2, 5 pp., printed, June 1962.

The following printed World Trade Information Service Reports, published by the Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

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Import Tariff System of Colombia, Operations Report No. 62-34, WTIS Part 2, 4 pp., 10 cents, June 1962.

Import Tariff System of Ghana, Operations Report No. 62-32, WTIS Part 2, 2 pp., 10 cents, June 1962.

Import Tariff System of Pakistan, Operations Report No. 62-35, WTIS Part 2, 2 pp., 10 cents, June 1962.

Licensing and Exchange Controls--France, Operations Report No. 62-33, WTIS Part 2, 8 pp., 10 cents, June 1962.

Licensing and Exchange Controls--Republic of Guinea, Operations Report No. 62-27, WTIS Part 2, 4 pp., 10 cents, May 1962.

ZOOPLANKTON:

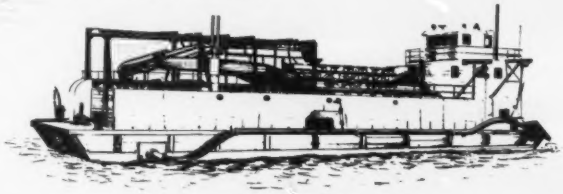
Sound Scattering Layers and the Vertical Distribution of Zooplankton and Fish in the Sea, by K. V. Beklemishev, Trans-109, 23 pp., processed. (Translated from the Russian Uspekhi Sovremennoi Biologii, vol. 41, no. 1, 1956.) U. S. Navy Hydrographic Office, Washington, D. C., 1962.

CORRECTION

In the July 1962 issue, page 130, under the heading: INTERNATIONAL COMMISSIONS, a review of the "Report by the President on the Ninth Meeting of the Permanent Commission Held in Copenhagen, May 1961," showed the wrong address for the Commission. The correct address is: Office of the Permanent Commission, East Block, Whitehall Place, London SW1, England. The Commission's financial year 1960 ended on 30th June and not 30th July as reported in the Review.

SUCTION DREDGE

This is a special type of capturing device used almost solely in the oyster industry. The oysters are removed from the bottom and brought to the surface by action of suction applied to the dredge head which is connected to a power pump on board the dredge vessel.



Suction dredge.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

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